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EDITORIAL.

Fixture Design in Relation to Architecture, Interior Decoration and Illumination.

The paper read by Mr. F. W. Thorpe on the above subject at the last meeting of the Illuminating Engineering Society has given rise to a very interesting discussion.

The question of fixture design and its relation to lighting problems is one in which the architect, the lighting engineer and the fixture manufacturer are all concerned. We have no hesitation in saying that in too many cases the importance of the lighting element in the whole scheme of decoration does not receive the attention it deserves. Although artificial light plays such an important part in the daily life of to-day the amount of care bestowed on the decorative aspects of lighting appliances is probably small in comparison with that given to them in the homes and halls of past ages, when the available methods of illumination were relatively primitive. It is a curious anomaly that some people are willing to expend considerable sums of money on the design of a noble and well furnished interior, and then become unduly parsimonious and indifferent when the method of lighting comes up for consideration; this applies particularly to many public buildings. Rightly

considered the lighting should form an essential part of the decorative scheme. A well designed unit puts the final touch to an artistic interior ; a crude and imperfect lighting fixture destroys the harmony of the design and prevents the intentions of the architect from being fully realised.

Nor should it be forgotten that in the present age the appearance of a room by night is even more important than in times gone by. When the only available illuminants were the candle and the oil lamp people did not live and work constantly under artificial light as they do to-day. There are many rooms (ball rooms, concert halls, theatres, &c.) which are used almost exclusively under artificial light, and even in the private house it is mainly in the evening that the inmates gather together and have leisure to observe their surroundings. A fixture should therefore be so designed as to be a pleasant object as well by natural as by artificial light. A fixture serves two distinct purposes ; it enables the room to be illuminated so that the surroundings are seen, and it should be in itself a decorative object. The first function is only exercised at night, the second both at night and in the daytime. One can recall instances of delightful metal work which by day is clearly visible, but by night is surrounded by intensely brilliant unshaded lights which prevent its outlines being conveniently seen. Appropriate shading, therefore, is an essential element in successful fixture design.

The decorative value of illuminated glassware, porcelain and coloured silks has perhaps not been sufficiently realised in the past. It must be remembered that the problem has been greatly modified by the introduction of the modern relatively brilliant illuminants—very different from the candles and oil lamps of days gone by. Merely substituting new lamps for old on antique fittings rarely leads to satisfactory results. To bridge the gap between the ancient and the modern often taxes the ingenuity of the fixture designer and the illuminating engineer.

This leads us to say a few words on one of the most debated points in Mr. Thorpe's paper: the desirability (or otherwise) of adhering to old traditional styles when dealing with new illuminants. In the case of interiors of ancient date and historic distinction the problem is undoubtedly a difficult one. Many good judges would agree that it is hardly possible to secure the same artistic results with modern illuminants, as with the oil lamp and the candle, for which the old fixtures were really designed. The conversion of these old fixtures is admittedly difficult in many cases. In some instances it may be preferable to re-design the fitting, still adhering to the period of the interior, but making allowance for the use of modern methods of lighting. The most successful results will usually be attained when the fact of modern illuminants being used is concealed by appropriate shading. For example, there is less objection to the use of electric, gas or acetylene imitation candles with candle chandeliers of the Dutch type, if agreeable silk shades are used ; similarly when electric incandescent lamps or incandescent gas mantles are introduced into antique lanterns, the appearance of the lantern as a whole would probably be better if the nature of the illuminant were concealed by diffusing glass, which modifies its brilliancy and enables the metal work to be more easily seen and appreciated. Unfortunately, if one may judge from the number of cases in which clear glass is employed, there is need of education before consumers can be induced to appreciate this view.

Another question that arises is the desirability of perpetuating the old styles. In this country, where tradition and veneration of a great and

historic past play such a great part in moulding popular ideas, it is, perhaps, natural that there should be a tendency to revert to the styles of the great decorative periods. Yet history shows that the changed conditions of each age do gradually bring about new methods and fresh ideas, and it is probable that the historian of the future will regard some of the recent developments as important transitions in fixture design. To discuss this question in detail would be to enter into the field of the architect and the decorative craftsman rather than that of the lighting engineer. Yet, as Mr. Thorpe has shown, each development in methods of lighting has reacted on the design of fixtures, and it is only reasonable to expect that the incomparably rapid progress of the last ten years will ultimately have an important effect. It must be conceded that the recent advances in gas and electric lighting, and the coming of new systems such as acetylene, incandescent oil, and petrol air gas lighting, have opened up new vista in fixture design and have made possible many departures which wouls have been out of the question in days gone by. We may even anticipate that the architecture of an age of artificial light will differ from that of days when buildings were considered mainly with a view to their appearance by natural light only. The shape of the modern schoolroom and factory is determined almost entirely by the admission of maximum daylight. May we not expect that some buildings which are mainly used in the evening will be influenced by the provision of the most satisfactory conditions of artificial illumination ?

All these are problems which demand the combined efforts of the architect, the fixture designer and the illuminating engineer. Mr. Thorpe has attempted to indicate the varieties of work in which these respective experts will have the predominant control, but in practice it will be found that their work is frequently inter-linked and that their provinces often overlap. The architect, as we have often pointed out, is in a position to render great services to the cause of good lighting and we hope that in the future illumination will assume a more important place in his education. In the higher fields of work the illuminating engineer has much to learn from the architect, and if he is to advise on the lighting of buildings of architectural distinction he should acquire some knowledge of and sympathy with his ideals. In the case of important buildings we see no reason why the architect should hesitate to invite the assistance of an expert in lighting matters ; and similarly a lighting engineer might often appreciate the help of an architect who had made a special study of fixtures and the artistic side of illumination. This is an age of specialisation. The general medical practitioner has no hesitation in calling in the specialist, nor does the patient demur at paying his fee. Even so the consumer will eventually recognise that in order to secure lighting conditions in keeping with a noble interior the services of an expert are often well worth paying for.

In what has been said above we have spoken mainly of interior lighting. But the field for enterprise and skill in the lighting of important public thoroughfares and squares and the treatment of the exteriors of public buildings is surely quite as great. Hitherto, it must be admitted there has been little attempt to consider the design and lighting of such areas as one harmonious whole. Town-planning on more scientific lines is rapidly growing in importance and should occupy an even more distinctive position at the close of the present war. Is it too much to hope that in the schemes of town-planning that are now on foot, the claims of orderly and artistic public lighting will receive a fair share of attention ?

Illuminating Glassware: a National Industry.

Illuminating glassware, it may well be said, will play an important role in the fixture design of the future. With modern powerful illuminants the consideration of the best methods of shading and distributing the light goes hand in hand with the design of the metal work by which they are supported. In many cases, it is not too much to say, the design of the fixture is to a great extent controlled by the nature of shades, globes or lanterns which it is intended to carry.

During the last few months it has come to many people as a surprise to find how greatly we are dependent upon foreign-made glassware for the maintenance of the lighting industry. There are exceptions, and we can recall one firm that manufactures scientific and decorative glassware of a high standard in this country. But the great bulk of the material is imported from abroad.

To the lighting industry this is highly unsatisfactory. In times of war supplies are greatly impeded and business is dislocated. In times of peace, when the supply is abundant, we have nevertheless been dependent mainly on the glassware designed by others, and our own efforts are accordingly influenced by whatever models are introduced from abroad. The ideal development of decorative art in connection with illumination would surely involve the capacity to make and design our own glassware in sufficient quantities; and it should be our pride, not to follow, but to lead the rest of the world.

Those who have studied Continental methods, who know the long experience and patient research that has largely enabled other countries to gain this supremacy, realise the difficulties in developing the industry in this country on a similar scale. Yet there is before us a great opportunity. Isolated efforts by small individual glassworks will not make this a national industry. But by co-operation on the part of the leading companies interested, and by the full utilisation of the scientific and technical skill of the country, such an industry might be established.

Unprecedented situations demand new methods. Already the gigantic step of establishing a national dye industry is being undertaken. Be the results what they may, it is an enterprising and praiseworthy effort. The glass industry is, to our mind, another instance of the need for national support. Besides glassware for illuminating purposes there are many sections of the industry, such as the manufacture of glass for optical and chemical work, of equal importance. Such glass is a valuable element in the construction of many scientific instruments and not a few munitions of war. In the glass industry there is surely another opportunity for co-operative effort.

We would like to add, what is common knowledge among those interested in this industry, that the organisation of the labour employed is as vital to success as the consolidation of the resources of those controlling glass manufacture. We venture to suggest that an exhaustive inquiry should be instituted by the Government into the causes which have contributed to hamper progress in years gone by, with a view to securing—if necessary by radical alterations in the labour conditions and other matters—the placing of this industry on a more satisfactory basis in the future.

LEON GASTER.

TRANSACTIONS

OF

The Illuminating Engineering Society.

(Founded in London, 1909.)

The Illuminating Engineering Society is not, as a body, responsible for the opinions expressed by individual authors or speakers.

SOME NOTES ON THE DEVELOPMENT AND DESIGN OF LIGHTING FIXTURES IN RELATION TO ARCHITECTURE, INTERIOR DECORATION, AND ILLUMINATION.

Proceedings at the Meeting of Illuminating Engineering Society held at the House of the Royal Society of Arts (John Street, Adelphi, London, W.C.), at 8 p.m., on Tuesday, February 16th, 1915.

A MEETING of the Society took place on Tuesday, February 16th, as stated above, Mr. Frank Bailey being in the chair.

The Minutes of the last meeting having been taken as read, the HON. SECRETARY read out the names of new applicants for membership as follows :—

Honorary Member :—

Edison, Thomas Alva Orange, New Jersey, U.S.A.

Ordinary Member :—

Young, Stanley Engineer to The Automobile & Electrical Equipment Co.

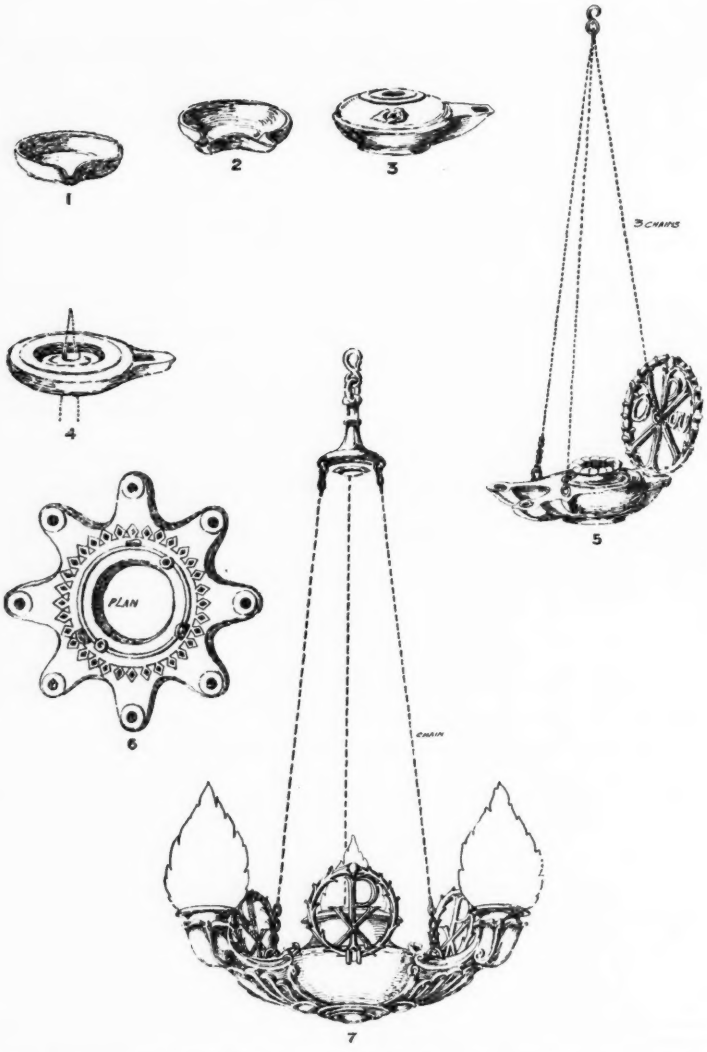
The names of applicants announced at the previous meeting on January 19th, were read again, and these gentlemen were formally declared members.*

The CHAIRMAN then called upon Mr. F. W. Thorpe to read his paper on "The Development and Design of Lighting Fixtures in Relation to Architecture, Interior Decoration, and Illumination," and a discussion took place in which the following took part :—

Mr. J. DARCH, Mr. A. P. TROTTER, Mr. E. P. WARREN, Mr. P. J. WALDRAM, Mr. C. H. BURT, Mr. J. G. CLARK, Mr. PERCY MARKS, and Mr. A. E. PENN. The HON. ASSIST. SECRETARY also presented a communication from Mr. W. D. HELPS.

In conclusion the CHAIRMAN called for a vote of thanks to Mr. Thorpe for his paper, and announced that the next meeting of the Society would take place on March 16th.

* *Illum. Eng.*, Lond., Feb. 1915, p. 52.



INFLUENCE OF ANTIQUE BOAT LAMP ON MODERN DESIGN.

FIGS. 1 & 2.—Simple Greek lamps in pottery, 5th and 4th century B.C.

FIG. 3.—Earthenware lamp. Roman occupation of Britain. Found in London.

FIG. 4.—Earthenware lamp, with hole in centre for fixing on spike. Roman occupation of Britain. Found in London.

FIG. 5.—Bronze lamp found in the catacombs at Rome and ornamented with the sacred monogram.

FIG. 6.—Eight-light earthenware lamp. Roman occupation of Britain.

FIG. 7.—Modern bronze boat lamp, based on Fig. 5, in the Jesus College Chapel, Dublin.

SOME NOTES ON THE DEVELOPMENT AND DESIGN OF LIGHTING FIXTURES IN RELATION TO ARCHITECTURE, INTERIOR DECORATION, AND ILLUMINATION.

By F. W. THORPE.

Paper read at the Meeting of Illuminating Engineering Society held at the House of the Royal Society of Arts (John Street, Adelphi, London, W.C.), at 8 p.m., on Tuesday, February 16th, 1915.

IN this paper it is proposed to deal briefly with the development of lighting fixtures and to show their importance in the decorative scheme. The paper has been written mainly with a view to opening the discussion on this subject.

It is hardly possible to give a very detailed account of the many styles of architecture and decoration. So much thought and care has been devoted by successive generations to bring these styles to perfection, that it would necessitate a life's study to master even one of them completely. Modern architects and designers often excel in one style only, showing considerable skill and individuality in associating old forms and details with modern requirements. In the latter part of this paper some general problems applying to fixture design as a whole will be dealt with, and instances will be mentioned in which the co-operation of the architect, the fixture designer and the illuminating engineer is required.

There are so many sides to the subject that the arrangement of the matter in such a paper as this in itself presents considerable difficulties. The best method seemed to be to begin by taking the lighting appliances from the antique onwards, and before proceeding to the discussion of modern practice, to trace the fixtures for various illuminants in use from ancient and mediæval times to the development of the gasolier and electrolier and other types now possible but impracticable in the past. This method will help us towards the better comprehension of the development of lighting fixtures, for the modern is the outcome of these old ideas. The fixtures designed in old and historic styles were intended to carry candles and oil lamps; but those of the present day, besides carrying the lamps, have also to provide access for the "fuel," *i.e.*, provision must be made for the working into the design of tubes conveying gas or electric wires. This alone, apart from the difference in the illuminant itself, has naturally had a material influence on the design of modern fixtures.

Let us begin therefore with the oldest civilisation, the Egyptian, with whom the story of architecture may be said to have commenced. Following them came the Assyrians and Babylonians, and then the Greeks, whose architecture and sculpture was such as might be expected from a highly civilised and refined people, and greatly influenced succeeding Art. The Romans developed their style after the Greek. In the Eastern Roman Byzantine Empire, Eastern influence played a great part, and with the overthrow of this Empire the Mohammedan Art developed.

The invasion of Italy by the Northern Tribes saw the decline of classic Art, which developed into Romanesque, and from Romanesque into Gothic, widely adopted throughout Europe. But this in turn was supplanted by the Classic Revival (the Renaissance) in Italy, which likewise influenced strongly all European Art.

Each country developed the revival after its own ideas. Subsequently, individual designers, such as the Brothers Adam, Chippendale, Sheraton and others, were successful in forming styles peculiar to themselves, both in architecture and furniture and interior decoration. The periods connected with the Renaissance in England are those with which we have mainly to conform in modern installations.

The Influence of Early Lamps on Modern Fixtures.

As artificial light became general with the advance of illuminants, the importance of the lighting fixture as a decorative object was recognised, culminating in the candelabra produced during the Italian Renaissance and the 17th and 18th century French periods, now models for most countries, and which many people consider have not since been excelled. As new illuminants appeared the nature of these fixtures was influenced, yet in many cases the original forms were retained. When twentieth century illuminants are used the question must, however, arise whether some of these old models can be properly adapted to the new conditions.

The adaptability of some of these to modern methods is nevertheless illustrated in some of the following plates, where examples of the old and new forms of fittings, both in the same distinctive style, are reproduced side by side. The simple " boat lamp " of the ancients, and also the crusie, rush and tinder-holder were subordinate to other articles of furniture, for we may safely assume that in these days artificial light was avoided when possible, and therefore the fixture did not receive the attention or occupy such an important position as the lighting fixture of to-day. Yet, whereas the antique lamp often surpasses the modern lamp in its artistic qualities, it was invariably defective from a purely utilitarian standpoint; the modern fixture on the other hand, although more efficient, seldom reaches the antique standard of beauty.

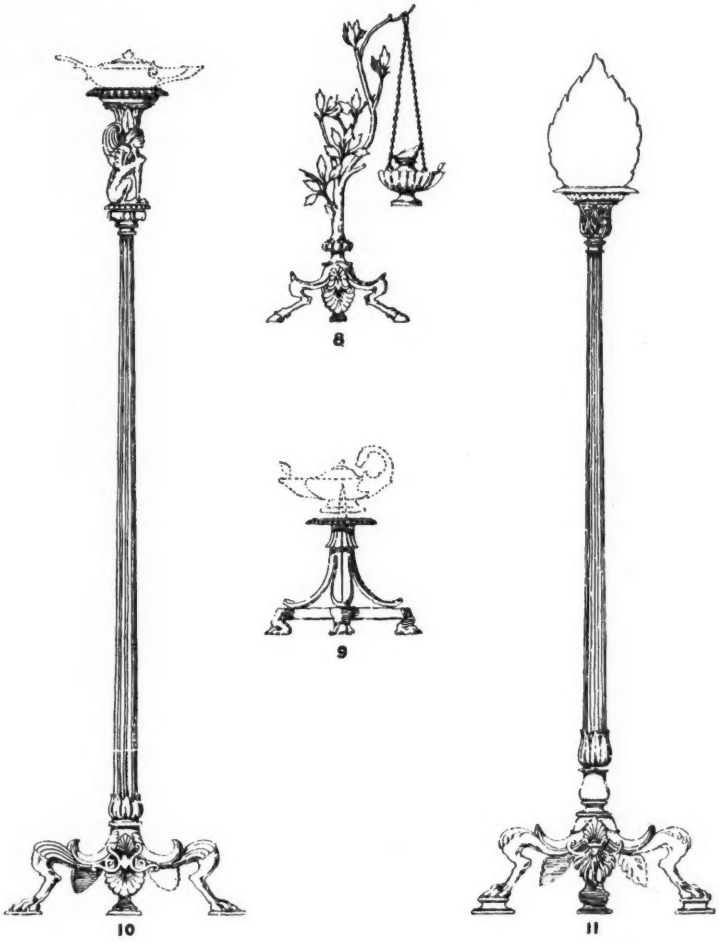
The boat-lamp was in use for centuries and is in use even at the present time in remote parts of the East; those made during the best periods of Greek Art are often beautifully proportioned and modelled with mythological decoration; they were mostly of pottery for a single burner, sometimes, however, for two, and occasionally for as many as ten. They vary in size from two to six inches in diameter, the majority being about three inches.

The Roman lamps were often of bronze with much more variety of design. Lamps in the form of the human foot or a bull's head may be seen in the British Museum. From the beginning of the Christian era they were usually decorated with views of Biblical scenes and symbols having a religious significance, replacing the Græco-Roman mythological ornamentation. Lamps of this kind were used for ordinary domestic lighting. They were also commonly deposited in tombs or kept burning at the shrines of martyrs, thus showing even in these ancient days the symbolism of light, used for religious and ceremonial purposes. The Romans, as might be expected, introduced the boat lamp into England, and several have been excavated. They are, however, seldom of bronze, and almost invariably in earthenware, with a small projection at the side for a handle. They were often placed in small earthenware trays in order that any spilled oil would be collected. These lamps are crude in comparison with those produced in Rome at the same period. The shape of the antique boat lamp was revived during the time of the Renaissance, again during the French Empire period, and is being revived once more in harmony with the prevailing style of Neo-Greek architecture.

Lighting Fixtures Based on Architectural and Decorative Periods.

The design of the lighting fixture has always been contingent upon architecture and decoration for their form and detail of ornament. Conventionalised natural forms, such as a branch of foliage, were often used by the Romans; in some instances the human figure and animal forms were used as a basis for the enrichment of the shaft.

In this way the candelabra was developed and came to occupy an important place in their domestic and religious life. The Romans were luxurious in the furnishing of their homes, and bronze candelabra were amongst the finest objects of furniture. The slender bronze models, of which a few shapes seem to have become standardised and made in great numbers, were mostly for domestic lighting, being made, like the modern electric standard, in two sizes for use on the table and the floor. The large marble candelabra were for



THE INFLUENCE OF THE ANTIQUE CANDELABRA ON MODERN DESIGN.

FIG. 8.—Græco-Italic lamp standard for suspended lamps, in bronze.

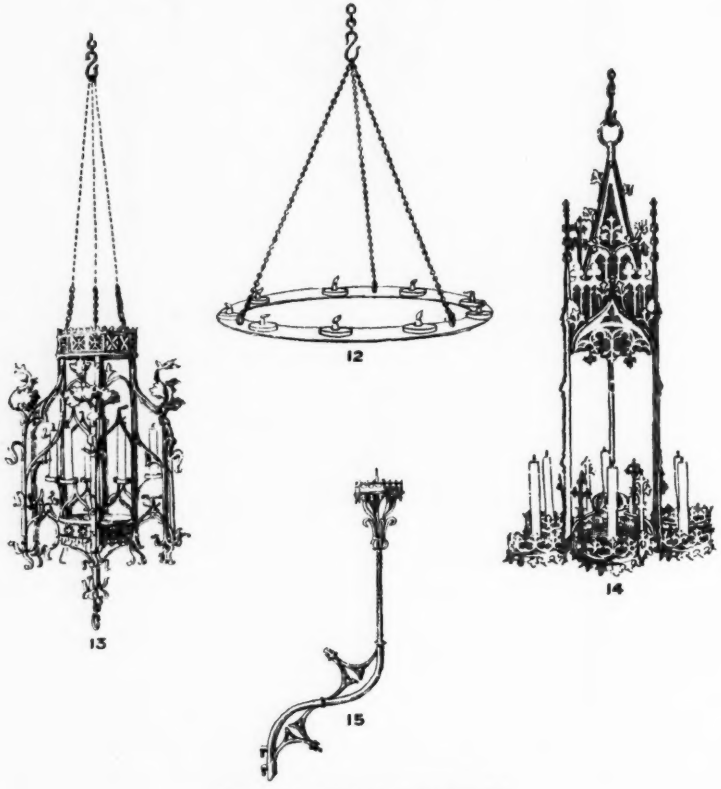
FIG. 9.—Antique bronze lamp-stand with spike fitting into bottom of lamp which can be used as hand-lamp and standard.

FIG. 10.—Antique candelabrum (Museum, Naples).

FIG. 11.—Modern electric standard based on antique. (From the Haymarket, London.)

religious and State ceremonial purposes. The bronze models invariably used had a flat capital upon which the boat lamp was stood. In some cases the stand terminated in a spike or projecting arms from which lamps were suspended. All these models afford excellent material on which to base modern designs and their frequent use by architects of the present day is justified by their beauty of design and proportion.

Reproductions of candelabra designed and produced by master craftsmen of the past are often adapted with a rigorous conservatism to modern requirements, their importance and correctness in the decorative scheme, often outweighing their practical utility as a lighting appliance.



ECCLESIASTICAL FIXTURES.

FIG. 12.—Form of fixture used in early Christian basilicas. (From *Illum. Eng*, N.Y.)

FIG. 13.—Mediæval wrought iron fixture for several candles.

FIG. 14.—Iron-traceried fixture for candles, 15th century.

FIG. 15.—Wrought iron fixture, French, late 15th century.

ECCLESIASTICAL FIXTURES.

It has been remarked that the candelabra mentioned above, besides being important objects in the home, played a part in the religious ceremonial of the ancients, as it does in many of the cathedrals and churches of the present day.

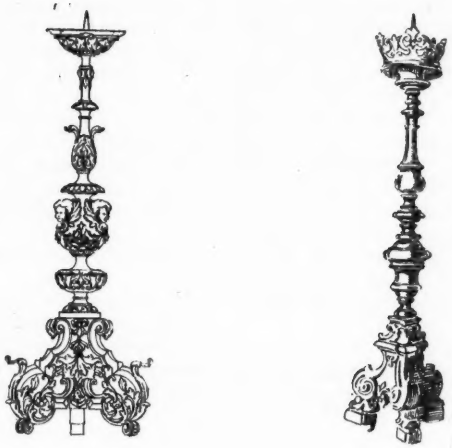


FIG. 17.—Renaissance candlesticks.

FIG. 16.—Lighting fixture from an Eastern Mosque, dome pierced all over.

FIG. 18.—Palazzo Strozzi lantern. (Renaissance.)

In the modern lighting of places of worship to-day we must uphold conservative treatment, remembering the importance of tradition in Ecclesiastical Art. Forms, sometimes symbolic, have been in use for centuries. We trace the plan of the modern church to the Early Christian basilica of the East. The various styles of church architecture from the Byzantine, the Art of the Christian East to Romanesque, the transition from antiquity to the Middle Ages, and to the Art of the Christian West, Norman, Early English, Decorated and Perpendicular Gothic—have all given rise to characteristic types of lighting fixtures of remarkable beauty of design and craftsmanship.

Churches are designed on traditional lines, and embody the individuality of the architect. Modern improvements, such as lighting fixtures, should form an essential part of the scheme and must be in harmony with the original design.

The fixtures of the Mohammedans, used in the lighting of the Eastern Mosque, are often of the familiar dome type. In the Middle Ages Persia became the most brilliant centre of Saracenic Art; which, travelling westward with the conquests of the Moors, left its influence upon the shores of the Mediterranean, especially in Southern Spain. The influence of architecture on lighting fixtures is here apparent, for the lamps are most shaped like the dome of a mosque, from the base of which are suspended glass cups containing oil and wick; their chief characteristic is a profusion of geometrical forms and conventional foliage. The workmanship of these lamps is to the Western mind wonderful, entailing considerable labour and skill. They make liberal use of the embellishment of damascening (one metal inlaid into another) and piercing so that when illuminated the piercing is seen in silhouette. (This is interesting as an early instance of deliberate use of artificial light for decorative effect. These fixtures only appear at their best when the silhouette effect, due to the artificial light, is produced.)

During the Italian Renaissance, the candelabra were revived along with the tradition of antique art; old forms were adapted to changed ideas. From this time onwards candelabra appear in many different types and made in various materials, the finest examples of which are to be found in the churches of Italy. On these models the majority of modern church candelabra are based.

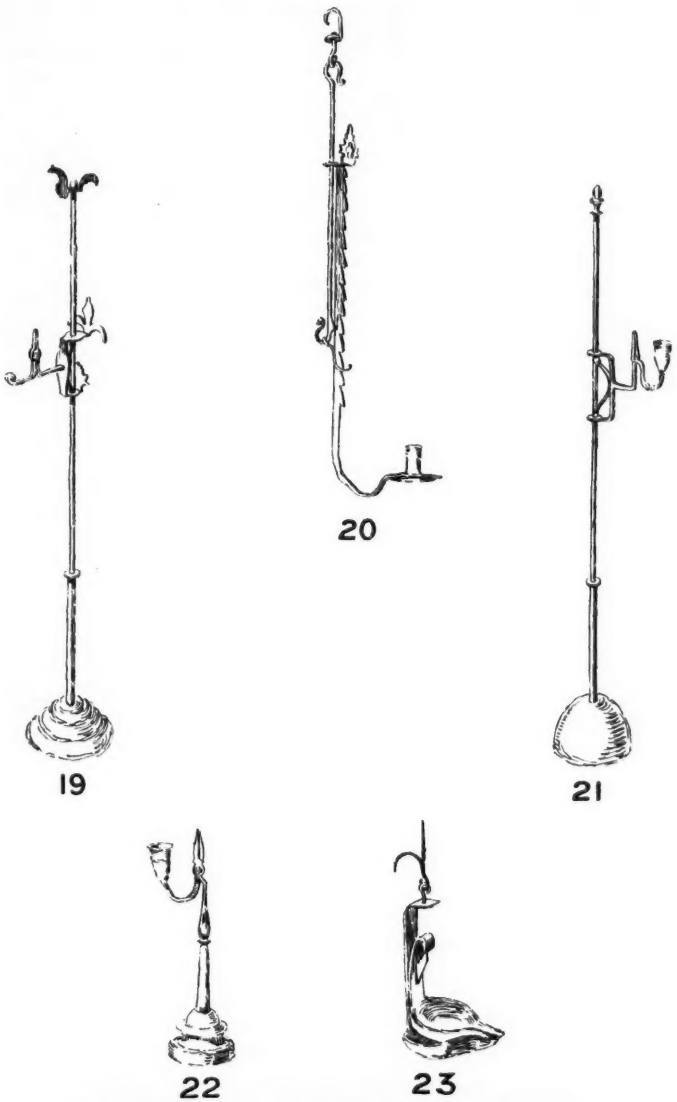
The architects of the Renaissance made full use of the lighting fixture in the embellishment of the exterior and interior of the churches and palaces of Italy. The lantern bracket outside the Strozzi Palace at Florence surely adds interest to the building.

Fixtures for Domestic Lighting.

Except in the mansions of the great the progress of illumination in the homes of the middle ages was comparatively slow, just as the methods of illumination were extremely primitive. But from Tudor times onward, although means of illumination were still limited, there was constant change in the type and style of the lighting fixtures. Style succeeded style in waves. New ideas were grafted to the old, and gradually superseded them as they apparently reached the limit of development.

The various countries developed their own art according to environment and temperament, and eventually evolving styles peculiar to themselves. In England, for instance, the furniture relied upon boldness of form rather than colour for effect. This was the age of oak, and ornament was still of an architecturally Gothic character. The iron rush and tinder holders used in domestic farm and cottage lighting of this date include many ingenious contrivances, some possessing distinct artistic merit.

Architects and designers in endeavouring to preserve in their reproductions of various rooms the atmosphere and spirit of the period require to be correct in regard to the gas or electric light fixture quite as much as in other details of furniture. Hence, if a room is to have the correct Early English atmosphere it is necessary to adhere to the correct old forms. This atmosphere is, after all, only obtained in the decoration; the fixtures are added to and regarded as furniture, and are primarily of æsthetic value owing to their shape and the colour-harmonies they make possible



ENGLISH IRON DOMESTIC LIGHTING FIXTURES, 17th AND 18th CENTURY.

FIG. 19.—Floor light with rush holder and wood base. Four feet high, adjustable up and down stem.

FIG. 20.—Suspension fixture and adjustable ratchet for candle.

FIG. 21.—Floor light with candle holder, adjustable on stem, wood base.

FIG. 22.—Table rush and candle holder with wood base.

FIG. 23.—Iron Scotch lamp (crusie) for oil.

(bright iron against oak, &c.). Because the illuminant is modern the resultant effect, with due consideration, need not be incongruous. In a modern room possessing decorative qualities, if it is not the aim of the owner to be correct in detail, any type of lighting fixture can be employed so long as it is in good taste.

In Mid-Tudor and Stuart times the Renaissance in Italy began to make itself felt in England. Italian ornamental details were grafted on to Gothic forms, often with pleasing results. Again, the close connection between the English and Dutch courts was the means of introducing new ideas into furniture, which depended upon colour as well as form for effect. (The effect of colour as applied to lighting will be mentioned later.) This, again, had its effect upon the accessory arts, and is noteworthy as leading to the introduction of the Flemish candelabra, perhaps the most popular of all lighting fixtures at the present day. Generally speaking, these chandeliers are in harmony with any classic room, being frequently used by Sir Christopher Wren (17th century) for the decoration and lighting of the old city churches. There appears to have been such a deep-rooted liking for these old candelabra that they have been used in turn for candles, flat-flame gas and incandescent gas burners, and later for imitation candles using gas, acetylene and electricity. It must be owned that the effect of such candles, equipped with suitable shades, is invariably pleasing, and the shades have the effect of concealing the actual light and disguising the fact that a modern illuminant is being used.

Inigo Jones was, perhaps, the first English architect to design on classical lines without Gothic influence. Succeeding architects all took up the classical Renaissance (which is, broadly speaking, a return to the best periods of Greek and Roman Art, 500 B.C.—300 A.D.).

From this revival sprang the classic revival in furniture and interior decoration in England and France. Chippendale, the brothers Adam, Sheraton, and Hepplewhite were designing furniture each in their distinctive styles with which we are familiar. In France the Louis XIV., XV., XVI., and Empire styles for which the French are so famous were influencing the decorative art of the whole world. The candle, as we know, was the illuminant with which these designers worked. All of them aimed at design of fixtures in harmony with the furniture and scheme of decoration. Chippendale, who worked in St. Martin's Lane, also designed many lanterns and girandoles to harmonise with his furniture, in the designs of which we trace the influence of French art.

Chippendale eventually went out of fashion, the Adams style coming into favour. The furniture became lighter in character and more classic in design. Sheraton and Hepplewhite followed, and we come then to the Victorian era, which is generally regarded as showing a great deterioration in style. At the present time designers in general follow some traditional style, and the changed circumstances of this industrial age somehow do not seem to favour the creation of new distinctive styles.

In what has been said above the author has only tried to illustrate a few characteristic periods of design, and to sketch very briefly the general course of progress since the early days of artificial illumination. There have been, of course, countless other styles on which much could be written; for instance, the wonderful creations of Japan, with their colour-harmonies in paper and silk, which seem to lend themselves particularly well to use with artificial light.

In the remainder of the paper it is proposed to discuss some of the problems that are of interest to architects, fixture designers and lighting engineers of the present day.

Various Phases of Interior Lighting.

A broad distinction may be drawn between domestic and public lighting. In the former individuality can be shown in the selection of fixtures, and the purchaser is free to follow his personal desires. In the case of public lighting (by which not only the lighting of the streets, but of halls and rooms, belonging to or habitually used by the public may be understood) novelty in design or system is not

desirable, an efficient lighting scheme, supported by fixtures well adapted to the architecture, is the chief requirement.

It is difficult to lay down definite rules as to the method of lighting best adapted for various rooms, every architect will have a different idea, and lighting requirements vary so much with the nature of the building, both in the amount of illumination and the effect desired. Care must be taken in the selection of the system, for we consider the relative efficiency of the direct, semi-indirect, and indirect principles, but often forget their relative decorative values. The fixture should be considered in effect as well as efficiency. Generally speaking, a ball room demands an effect of gaiety, a dining room comfort, and a library an air of repose—all of which conditions may be secured by the judicious selection of fixtures, strength of illumination, and use of colour. These considerations have been dealt with from the lighting standpoint, but not the decorative, in several papers before this society. There are certain general requirements should be fulfilled, whether we are dealing with

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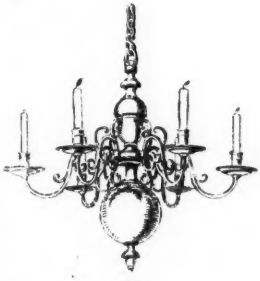

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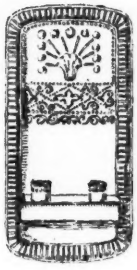

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DUTCH.

FIG. 24.—Six-light fixture in the Burgomaster's Room, Town Hall, Haarlem.

FIG. 25.—Modern fitting designed for the modern lighting of Sir Christopher Wren's Chapel, Greenwich Palace, showing Dutch influence.

FIG. 26.—Hand-beaten brass sconce for two candles, Dutch, early 18th century. The back plate, highly polished, acting as a reflector.

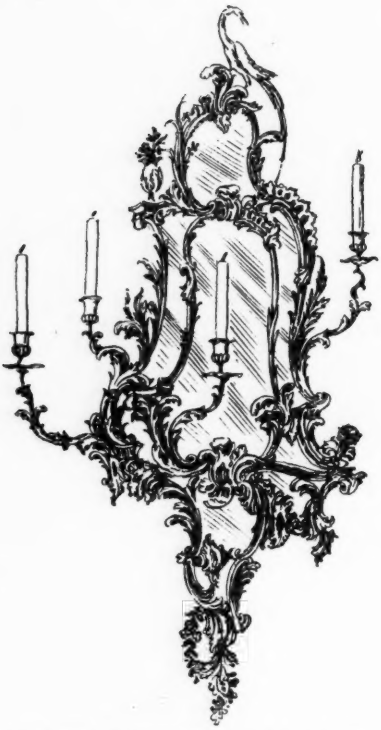


FIG. 27.—Chippendale Girandole, middle 18th century.

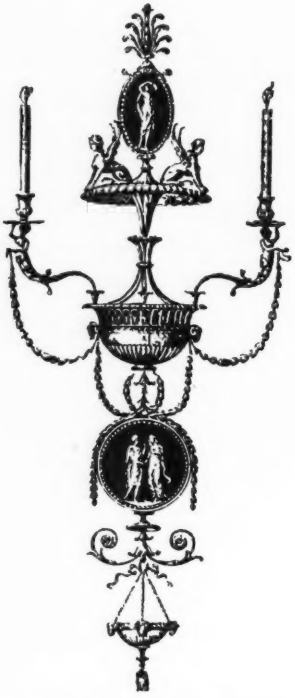


FIG. 28.—Girandole by the brothers Adam in the Etruscan room at Lord Derby's.

FIG. 29.—Hepplewhite fitting.

FIG. 30.—Chippendale Lantern.

ENGLISH EIGHTEENTH CENTURY.

FIG. 31.—Reproduction of a sconce designed by Daniel Morot. Period Louis XIV.

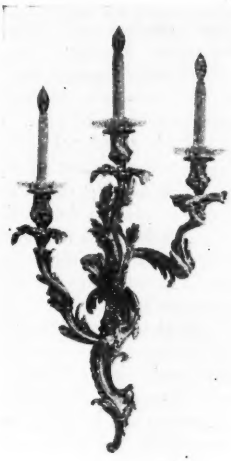


FIG. 32.—Candelabrum. Period Louis XV.

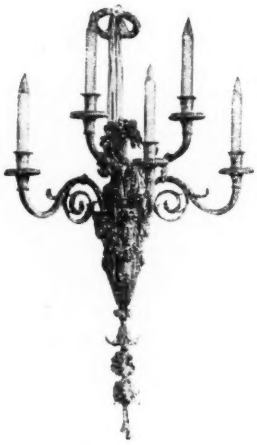


FIG. 33.—Candelabrum from the Petit Trianon. Period Louis XVI.

FIG. 34.—Caryatid Bracket. Empire period.

FRENCH.

an old interior or a modern room. One of the most important of these is the choice of appropriate glassware or shades to go with the fixture. On entering a room lighted by artificial means the natural tendency is for the eye to travel involuntarily to the brightest object. One not infrequently finds good metal work in combination with unscreened lamps or mantles giving a glaring effect and hard shadows, such as are not desirable from a practical standpoint and are usually out of harmony with the æsthetic claims of the room. Broadly speaking, lighting that is inconvenient to the eye is also inartistic. In the past, artificial illuminants were invariably of low brilliancy. The candle and the oil-flame had a brightness far less than that of the incandescent filaments and mantles of the present day and the tendency of tradition is therefore towards soft and moderately bright effects.

The correct shading of artificial illuminants should therefore be considered in connection with fixture design. In some cases it may be said that the best lighting is unobtrusive. There are instances in which the illuminated surroundings constitute the vital point of interest and it is preferable not to have one's mind distracted by speculations as to the origin of the artificial light illuminating them. But in many other cases the light source may be made an essential part of the scheme of decoration. A fixture equipped with pleasantly shaped and coloured shades adds considerably to the decorative value of the room both by night and day. Fixtures are apt to be considered too exclusively from the standpoint of their appearance in daylight. At night-time, when they fulfil their useful function of illuminating the room, their appearance should also be pleasing. Care must therefore be exercised to ensure that the artificial illuminant does not distract the eye in following the lines of the fixture. One meets many cases in which the great brightness of a lamp placed within a clear glass lantern makes it impossible to see the metal work ; in the daytime one sees the outline clearly, but when illuminated one no longer sees the fixture but only the source of light—by no means a decorative object. One may therefore lay stress on the importance of decorative silk and glassware in the scheme of lighting. There are instances in which the desire to be correct to period makes it impossible to use diffusing globes and bowls now becoming so common, but they certainly have an important rôle to fulfil. In passing one may refer to the disturbance in the glass industry caused by the war. It is well known that most of the fine examples of glasswork come from abroad. The difficulties of establishing such an old-established industry in this country are doubtless great, but not insuperable.

Strictly speaking, the use of an electric lamp or incandescent mantle in an Adams, or Tudor, interior, may be considered an incongruity. But the incongruity is lessened if the modernity of the source can be concealed. Thus electric candles can be used with silk shades, and it is difficult to find a prettier effect. Modern illuminants can be used with antique lanterns if diffusing glass is employed to screen the lamps from view. The white glass bowls used occasionally with Flemish features are admirable in this respect, since they can be used with any illuminant, electric, gas, acetylene, etc., concealing the source and giving a soft illumination of the semi-indirect type. By such methods various old models, where desirable, can be adapted to the requirements of modern illumination.

Fixtures for Public Lighting.

Much that has been said applies both to domestic and public lighting. But in the latter case the claims of good lighting from the decorative standpoint are particularly pressing. A fine public hall, a church, a museum—buildings that are frequented by the general public—deserve illumination in conformity with the architectural scheme. In a private house defects of taste are perpetrated by the individual ; but the conditions in public buildings reflect the artistic sense of the nation.

The lighting of such buildings is too frequently neglected. There is a tendency for the illumination to be considered at the last moment, when the building is almost complete, and the money set apart for its adornment almost exhausted. Not infrequently the lighting is handed

over to the contractor at the last moment, and he receives few instructions except those that have reference to economy. Cases could be mentioned of public buildings where the interior is impressively designed and lavishly decorated, but the fixtures are of the crudest description and have no relation to the general scheme of the building, although the illumination may be considered good.

To the architect it should be a matter for concern how the interior designed by him is lighted. Now the conditions are entirely different from those that prevailed in the past when artificial light was in a primitive condition and the use and appearance of buildings by artificial light was not contemplated to any great extent. But in the present day there are many buildings where this condition is almost reversed. It is difficult to comprehend, when one remembers the care and thought expended in the adequate natural lighting of a building, why the artificial lighting should not always receive the same attention.

It is therefore essential not only that good and suitable fittings should be designed under the architect's supervision, but that these fixtures should be placed in the right positions and give the correct illumination. Upon this depends the whole success of his efforts as far as night time is concerned. The harmony of his scheme may be wrecked by tawdry and incongruous fittings. The amount of light to be given to each portion of the room needs to be very carefully considered. The position of fittings should be decided at an early stage in the design of the building, thus obviating the frequent practice of placing brackets on the centre of good columns, or over mouldings, spoiling the architectural scheme instead of adding to its effect. The positions of chandeliers is usually fixed by the nature of the outlets provided on the ceiling, and their practical utility in these positions, as well as their part in the decorative scheme, needs to be considered. One could mention cases in which the use to which the room is to be put has not been sufficiently considered; chandeliers have been fixed at points such that the utmost ingenuity of the lighting engineer failed to achieve a proper distribution of light.

It is beyond the scope of this paper to deal with specific problems in lighting, but one type of building—the church—deserves special mention. There are those who consider that in churches of historic and national value the atmosphere should be preserved by retaining old fixtures and illuminants. This is an arguable position, but as a matter of fact the introduction of modern illuminants, at first vigorously opposed, almost invariably comes to pass sooner or later. But it is curious to see that in many such cases the new illuminant, when it is introduced, is employed with little technical skill, and without any serious attempt to grapple with the complex problem of using new illuminants and fixtures in old surroundings. There are, perhaps, few problems in lighting that present such varied aspects. Besides considering the architecture one has to bear in mind the practical points involved in the needs of the worshippers; in large mosques and cathedrals, where the service is mainly carried out by the priest or choir, the congregation do not need so much light as in a modern English church where they take an active part in the proceedings.

Even in those cases in which the lighting has been considered with some care, one often finds a curious neglect of period. For example, while the lighting of Westminster Abbey may be good, the modern fixtures are not in keeping with the architecture. They are not Gothic, but have a strong Dutch influence. Those installed in Liverpool Cathedral are perhaps not so efficient as lighting units, but they are certainly in harmony with the architecture of the building.

Before leaving this part of the subject a word or two may be said as to the part played by fixture design in exterior lighting. It is a remarkable fact that, while people will spend considerable care on the artistic side of interior lighting the possibilities of outdoor illumination have scarcely been considered. Lamp-posts are erected bearing no relation to the surrounding architecture. Now in the case of existing squares and streets, which have grown up more or less chaotically, there may be difficulties in obtaining a coherent scheme. But

in the planning of new streets and squares and town-planning is a science that is attracting much attention to-day —the lighting and the architectural scheme of streets and squares should surely be planned simultaneously so as to form one harmonious whole. There have been a few attempts to design special lamp-posts. A fine model was worked out some years ago by the Royal Academy, and so far as the author is aware the design has not been duplicated. The original model was presented to the Office of Works and now occupies a somewhat forlorn position in the Horse Guards Parade. Another instance of good design is the bronze standards in The Mall. Lamp-posts are usually purchased by the borough engineer. It would be desirable for the designs to be first submitted to an architect.

There are also possibilities in the treatment of fixtures attached to the frontages of buildings, which should be designed to conform with the architecture. Again, the electric sign need not be the hideous object which architects rightly condemn. How often do we see and admire fine modern buildings—when the scaffolding is removed, and the work of the architect and the decorative craftsman are revealed —only to find that with the entrance of the tenant a large electric sign makes its appearance, sometimes placed right across the building, spoiling proportion and often hiding good ornament. This happens in the case of almost every theatre and place of amusement erected. We cannot blame the owner, who intended all along to have such a sign, nor the electrical contractor for persuading him to have one. A solution would be for the architect to design a space for the sign, in the same way as one is left for the facia of a shop. This may present architectural difficulties in some cases, but as a rule they could be overcome by co-operation, at the proper stage, between the architect and the electrical engineer.

The Influence of Light and Colour on Decoration.

It has already been pointed out that the fixture is an important part in the scheme of decoration. But besides this function the lighting unit has the effect of illuminating surrounding decorations and enabling them to be appreciated. The nature of these decorations should, therefore, have an influence in determining the scheme of lighting to be adopted. For example, if a hall has a very ornate ceiling and frieze, it is not a satisfactory plan, from the decorative standpoint, to use fixtures which concentrate nearly all the light downwards, leaving the ceiling and frieze in semi-darkness.

The part played by colour in furniture has been mentioned, but the possibilities of colour have been neglected in modern fixture designs. The absence of colour is sometimes considered a drawback to indirect lighting for domestic use: semi-indirect and direct offer more scope by the simple use of coloured material to screen the light. The old-fashioned tent dining-room light would have been abandoned long ago were it not for the colour effects to be obtained. The selection of colours in the lighting appliance to harmonise with the walls and furniture in a room offers scope for considerable ingenuity and taste.

Modern Developments.

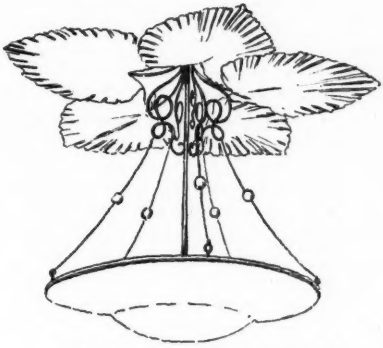
The above remarks lead one naturally to speak of some modern developments in fixture design. In this paper the architectural and decorative aspects have been mainly discussed, but it must not be forgotten that there is a practical side. Of late years a great deal of attention has also been devoted to the design of fixtures with a view to the distribution of light in the most efficient manner, and in many cases entirely neglecting the artistic standpoint.

It must be admitted that several types of fixtures designed on traditional lines, and perhaps based on old models, are not particularly efficient as distributers of light: the metal work leaves little to be desired, but the arrangement of lights, shades and reflectors are often inefficient.

For the lighting of modern rooms the scientific as well as the artistic design of fixtures is of considerable importance, and the requisite distribution of light, together with the desired artistic qualities, can be obtained with these old models

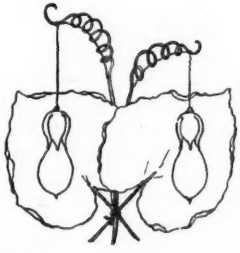
if arranged to meet modern requirements. But it must be borne in mind that the concentration of the greater part of the light downwards by the direct

100-light Electrolier shown at the Crystal Palace Exhibition, 1882.



Early semi-indirect fixture.

Semi-indirect bracket lighting with screen to avoid glare.



Bracket lighting with reflecting surfaces accentuating glare.

SOME EARLY ELECTRIC FIXTURES.

TAKEN FROM A TRADE CATALOGUE ISSUED ABOUT 1888.

method, which is rightly insisted upon from a utilitarian standpoint, may not always be desirable from an architectural standpoint; the distribution should vary according to the nature of the decorative surfaces to be illuminated, and, as we have seen, is often limited by the necessity of faithfulness to period so often insisted upon.

The indirect and semi-indirect systems of lighting represent a typically modern development, although, as some of the accompanying illustrations show, they were not unknown in the early history

of electric fixture design. The relative merits of these systems hardly fall within the scope of this paper. It is a question how far they can be combined with any of the traditional styles. Indirect fittings of certain periods (Tudor, for example) are sometimes made, and their effect may be pleasing. Yet an indirect fitting in a Tudor manor house, having, perhaps, half-timbered ceilings, however deftly adapted, would seem to be an anachronism.

On the other hand, in lighting halls with very fine painted ceilings (the Dyers' Hall, recently reproduced in THE ILLUMINATING ENGINEER, is a case in point) the method is effective, provided other supplementary lighting is included to relieve any possibly depressing effect from dark surroundings.

A number of typical modern fittings are shown in which indirect and semi-indirect component parts are used, combining the advantages of the three systems in one fixture. These methods are admittedly largely the result of recent improvements in the efficiency of lamps, and are an interesting illustration of the effect of advances in lighting apparatus on the design of the future.

USE OF ARCHITECTURAL FEATURES IN ILLUMINATION.

Finally, a word or two may be said on certain developments in lighting which, while not strictly coming within the scope of fixture design, have a certain bearing on what has been said above. The use of indirect and semi-indirect lighting should have a distinct influence on ceiling decoration, and it is conceivable that such methods might give rise to an entirely new system of decoration. In buildings used mainly by artificial light (theatres, for example) the design of the ceiling has often been expressly adapted to artificial light. Domes have been constructed acting as reflectors, in other cases ceilings and columns of diffusing glass or alabaster have been built in and lamps mounted behind them, and cornice-lighting has been applied in conjunction with decorative friezes; but these novel methods are not applicable to general practice.

CONCLUSION.

In conclusion, it may be well to summarise the main points of the paper with a view to promoting discussion. It may be suggested :—

1. That in dealing with interiors of a distinctive period the appearance of the fixture is just as important as the illuminating efficiency. In such cases it is best for the architect to select the type of fixture; ensuring, by co-operation with the engineer, that it embodies modern practice as regards efficiency.

2. That in industrial lighting, such as printing offices, factories, &c., these are best arranged by the illuminating engineer, who should be consulted by the architect.

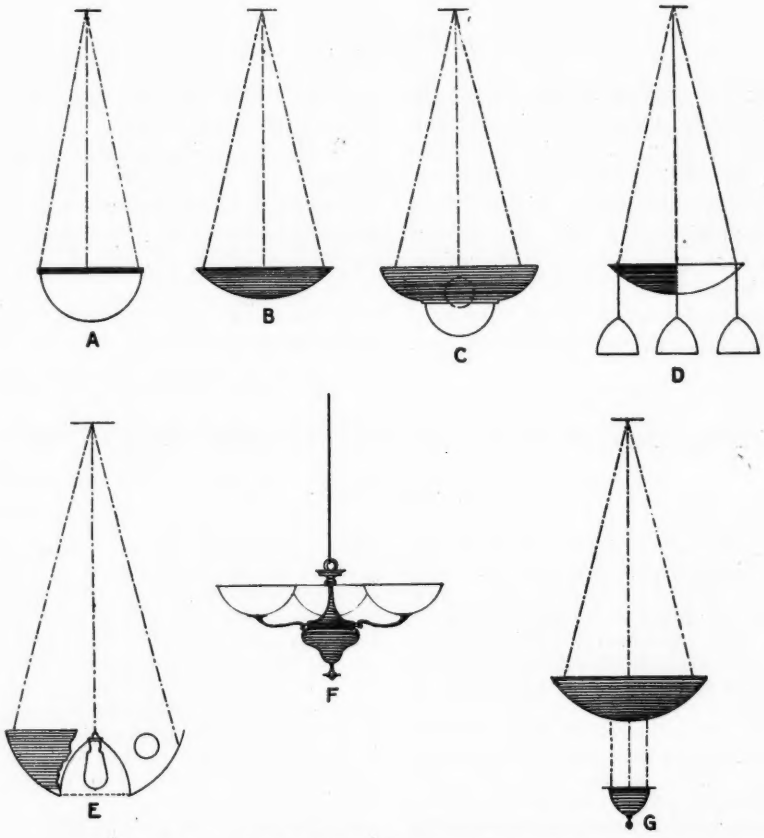
3. That where it is desired to preserve the correct atmosphere of an old-period room it is permissible to reproduce the fixtures of the particular period, remodelling them carefully to present ideas, which can be done without incongruity.

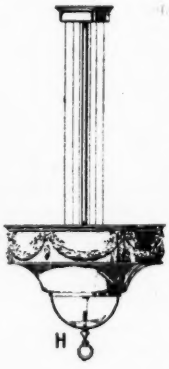
4. That with a modern room making no claim as to purity in style any system of lighting and type of fixture is permissible as long as adapted to the practical requirements of the room.

5. That in outdoor lighting the decorative possibilities of illumination have not yet been properly appreciated.

6. That it is sometimes advisable to consider the method of illumination before designing the room, as various systems of lighting are best adapted to enhance certain schemes.

7. That the above considerations point to a much-needed co-operation between the architect, the engineer and fixture designer, with a view to raising the artistic as well as the practical aspect of illumination to a higher plane.





SOME RECENT DEVELOPMENTS IN FIXTURE DESIGNS.

A.—Ordinary semi-indirect fixture.

B.—Ordinary indirect fixture.

C.—Combination of indirect and semi-indirect fixture for half-watt lamp, suitable for large halls.

D.—Combination of indirect and direct, or semi-indirect and direct fixtures, wired on two switches so that either system can be employed at will.

E.—Combination indirect and direct, on two switches, so that either system can be employed at will.

F.—Indirect or semi-indirect fixture, useful where an ornament fixture designed on traditional lines is desirable.

G.—Indirect fixture, with extra pendant designed to illuminate the ornament and relieve the dark effect of a large indirect bowl.

H.—Lowering arrangement for indirect or for semi-indirect systems, desirable for ease in cleaning.

DISCUSSION.

The CHAIRMAN (Mr. Frank Bailey) said the paper was a most comprehensive and discursive one upon a very important subject. It contained many points of interest to architects and designers of fittings, and to those who supplied the illuminant or who were responsible for illumination. He thought he could not do better than leave it to the architects and designers to commence the discussion, which he hoped would be a thorough and critical one, in order to show appreciation of the worthy effort of Mr. Thorpe in preparing the paper. He would now call upon Mr. J. Darch to read a special contribution which he had prepared relating to the subject matter of Mr. Thorpe's paper.

Mr. JOHN DARCH then presented his contribution as follows :—

ON THE PRINCIPLES OF DESIGN IN LIGHTING FIXTURES.

By JOHN DARCH.

FROM the point of view of the fixture manufacturer Mr. Thorpe has given us a very excellent and interesting paper which any architect will fully appreciate, but there are some other points of view in connection with the design of lighting fixtures to which attention should be drawn.

One looks back with pleasure, if not with envy, at the creative minds of the past; but as we are living in a very different age, the question that arises is whether true art does not demand that 20th century light should have 20th century fixtures.

What is true art? Certainly not the slavish copying of the past. That is mere mechanical work. The beautiful art of former days was adapted to its own necessities. When tallow lights of one candle-power were used it was perfectly proper to distribute them on wide-spreading frames brought down nearly to the head level. Some of us have seen the great candle hoops or coronas in old churches or the great branching chandeliers in our old baronial halls, with their tallow cups for catching the grease; and we have seen them, grease-cups and all, not copied but caricatured in modern buildings for use with gas and electricity.

As the Renaissance killed national art so this unfortunate mania for indiscriminate copying is as inimical to progress as to true art. Before the Renaissance of the 16th century, design in architecture and metal work was evolved out of constructional necessity; art was living and progressive, adapting itself to changing circumstances, and there can be no doubt that if electric light or high-power gas had been then invented, the artists of that day would have grappled with it and produced suitable fixtures.

But we, in our day, are so prejudiced by tradition that we are impeding the progress of our big and promising boy by keeping him dressed in the long clothes of his infancy. Indeed, some people feel that a room without a chandelier is as incomplete as a coat without a tail.

The manufacture of light is daily cheapening and improving, and the tendency everywhere is in the direction of high illumination: we are emulating daylight in its intensity, distribution and colour—and quite right too. How, therefore, can one justify the employment of antique patterns, divorced from their designed purpose to the service of the metal filament lamp or the gas mantle which cannot be reduced to a sufficiently low and congruous intensity? There are, of course, numerous cases where authentic copies of good prototypes or their

modern variations may be eminently suitable, but high-power lights involve an altogether different class of fixtures, or no fixtures at all, and Mr. Thorpe in his later paragraphs admits as much.

In seeking for ideas we may learn much in Mother Nature's school, from whence the greatest artists have ever drawn their best inspirations. This does not mean that we should make brass and iron flowers, leaves or branches, or crawling dragons, stalking storks or flying cupids for gas fixtures. That would be most *un*natural. If nature made lighting fittings, she would never show her poverty of invention by serving up some of her old vegetable or animal forms, but she would produce something that would be not only original but eminently suitable. And yet—and this is the point—she would make use of the same old principle on which she has made everything else, that of *Fitness*—fitness for its purpose and fitness for its place. In other words, Utility and Beauty conjoined.

In designing, it should be remembered that an essential element of beauty is that the outward characteristics should reveal the inward purpose. Let your designs be true and honest. Necessity is the mother of Design (if one may adapt an old proverb). Make a virtue of necessity and let the necessary features of construction themselves form the lines of beauty.

Utility must be the first consideration, and to that end know what you have to provide for, such as the purposes of the illumination, the intensity required at the working points, the nature of the distribution, the consideration of shadows, the care for people's eyes, &c., and then design your fixture exactly to meet those requirements. After this the soul of the artist enters, under whose governing influence there are few utilitarian forms that cannot be made attractive without piling on a redundancy of construction to make it look like something else. The lines of beauty in a horse or in a human face are entirely made up of essential working parts; nothing has been added for mere ornament. Anything added would be an excrescence, like the wart on Oliver Cromwell's nose. If, however, true art demands it, by all means let us have the wart or the scrolls or what not; but the whole history of art testifies to the fact that the best work is that in which charm is put into an article without the need of superfluous ornament. The man who can make a teapot graceful and attractive by simply shaping it, has done far better work in the cause of art than he who can only beautify it by masking it with scrolls, leaves and flowers. "Beauty unadorned is adorned the best": and this may be taken as an excellent motto for the design of fixtures.

Leaving general principles, let us particularise and consider, for example, a public hall in which architectural features of the orthodox Renaissance type adorn the walls. The charm of this class of work lies entirely in the proper application of light and shadow, and being designed for a top light, *i.e.* the sky, becomes an abortion when illuminated in any other way. To do our duty to such features we must apply a literal "lamp of truth," and with modern high power light, either gas or electricity, it is easy enough. If direct lighting be preferred, we can light from the ceiling and every part of the hall will be correctly illuminated; the intensity, of course, being made sufficient for requirements below. Now the fixtures for this will hardly come within the ordinary category, but whatever may be necessary should fall in with the design of the ceiling. If indirect lighting be preferred, even a truer effect will be obtainable on the architectural or any plastic features. In both these cases the fixtures should be solid and sufficient, and ample opportunity exists to make the reflecting dishes and their supports graceful in form without extrinsic ornament. If special lighting is required for the platform special fixtures are necessary which should be designed in keeping with the surroundings, affording protection to the eyes of the audience, and the more unobtrusive the better. Suitability is more pleasing than ornamentation and practical success than either, for the mind needs to be satisfied as well as the eye.

Churches, to the fixture designer, may seem to be an easy subject because of the prominence of ecclesiastical art in the past, but in reality it is found to be the most difficult, successful illumination

with them being the exception. The reason is that the fixtures take precedence and govern the illumination instead of the illumination governing the fixtures. In the days when our mediæval patterns were originally devised, evening services were not the rule, and when they did happen, as folks could not read, a few guttering candles met their needs. But here we are, to-day, trying to fit a square peg into a round hole, for the principle of candle lighting will not adapt itself to that of modern illuminants and is, naturally, a disastrous failure. To see anything at all the worshippers in a church have to peer through a forest of low-placed lights on quasi-Gothic standards or pendants or, at least, to endure the glare of lamps from a couple of brass pulpit standards that, however handsome, one cannot admire. The chancel, we are informed, is beautifully decorated, but it is impossible to see it, because of the branched stall standards with their gleaming points of light; and as the upper half of the church is lost in a heavy depressing gloom there is no diffusion.

Much of this is due to the lure of the fixtures; there is more anxiety to get something striking than to provide for the needs of the people. Architects are not always to blame. I have, myself, had much trouble with building committees who are afraid to depart from conventionalities.

The chancel may be easily and beautifully illuminated by concealed lights for which no fixtures, as such, would be necessary. For the body of the church the fixtures would depend upon circumstances, but the days of imposed penances are past, and the people should not be punished by the glare of visible lights. The pulpit or the chancel screen may have handsome standards that could and would be properly admired if the lights thereon were fully screened. Natty little picture lighting fixtures might be designed for the wall notices.

In public and private Picture Galleries, chandeliers or pendant clusters are commonly used, consequently the pictures cannot be seen without considerable dodging. Where there is an extensive ceiling, indirect lighting gives the best results and opportunity is afforded for a handsome fixture. Where there are skylights the artificial lighting should be direct and come from the same angle as the daylight. Short pendants, hooded with opaque reflectors, are economic and give good results; and here is an open field for the designer, for what little has been done in this way has made no pretence to beauty.

In Domestic lighting, it may be argued that the orthodox fixture is a *sine qua non*. Let us take the drawing-room. If the householder is artistic there will be something to be seen. Now the ordinary fixture, with the lamps dotted about near the eye level, militates against a proper view of anything. The lighting in a drawing-room should be general and the lights kept out of the eyes. For direct lighting, ceilings may be designed and panelled out to take holders, in which case nothing in the way of fixtures is necessary. In indirect lighting there is ample scope for artistic fixtures. In small drawing-rooms brackets of some

FIG. 1.

"period" would be admissible if the light were screened so as just to avoid the eyes and yet admit direct light to the whole of the ceiling and walls. The most unreasonable and yet the most popular form of brackets and chandeliers are those with swan-neck arms (Fig. 1) which look downwards and outwards, and carries a "shade" that shades nothing.

In a dining-room the principal consideration is the table, and in most cases nothing is better than a pendant with a large and densely-coloured flounced shade adjusted to a width that will just avoid the eye in sitting or standing. Here is an opportunity for taste rather than elaboration. Such a fitting should be adjustable at least up and down, and better laterally also. The derrick-looking "Surprise" pendant is exceedingly useful in this way for rooms of a moderate size; its great advantages amply compensate

for its want of symmetry. In larger rooms, the more shapely rise and fall table pendants are preferable, while simple but elegant standards and brackets, which may aspire to a "period," may be necessary for table ends, sideboards, fireside, &c.

In libraries, whether public or private, wide-spreading foliated brackets and chandeliers are particularly out of place. In the small library a neat central light will serve both for general illumination and for illuminating the bookcases. The designer's ingenuity will be well expended in producing a good table lamp. It should be elegant, solid and simple; it should overhang and be provided with a device that would make it easily adjustable so as to vary the desk illumination from 2 to 10 foot-candles.

When Art ceases to be consistent it ceases to be true. There is a tendency with certain so-called artistic electricians to mistake oddities for art. For example, a Birmingham edition of a Roman *hand* oil lamp, as Fig. 3, has been slung up as a pendant and an electric lamp bulb stuck in the spout—not as a joke but for serious use. Again, a glass vase instead of standing on its base (Fig. 4) has been chained up as a pendant and used as a globe with a lamp inside.

Finally, it may be pointed out that a serious impediment to progress exists in the great fixtures industry itself. Thousands of workmen are daily engaged in the monotonous production of stock patterns over which the controlling force is not art but dividends. Mr. E. L. Elliot,

FIG. 2.

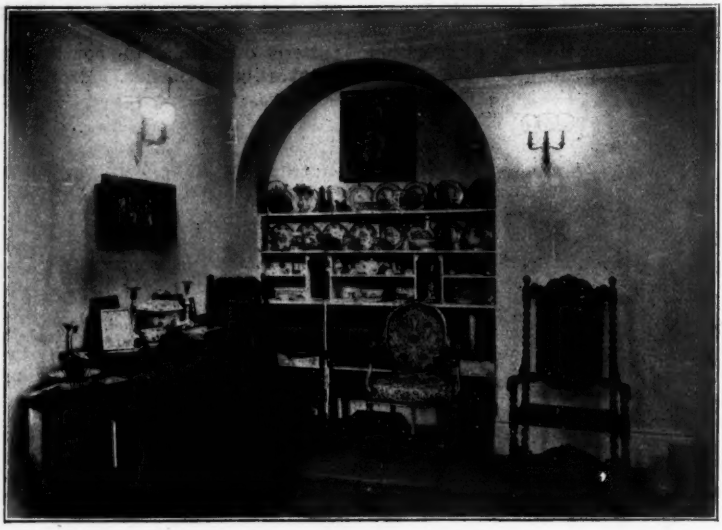
FIG. 3.

FIG. 4.

Badly-lit porches, halls and staircases are the rule—largely attributable to misplaced lights but sometimes to absurd fixtures. For example, there is the clumsy Guy Fawkes lantern (Fig. 2)—the acme of high art—that throws more shadow than light and enables us to discover the presence of mats and occasional steps in a manner more lively than pleasant.

of New York, in a paper before the Illuminating Engineering Society said: "There is no denying the fact that a very considerable part of the faults of lighting are directly traceable to a desire for profit on the fixtures. Look," he says, "at any fixture you please and judge for yourself how much is mere excrescence hanging on in the name of art, but having its true motive in the pocket-book."

Mr. A. P. TROTTER said the title of the paper was a reminder of the disadvantage in modern lamps whether gas or electric, as it contained the word "fixture." When he was young, lamps were not as a rule fixtures. When the daylight failed they used to ring for the lights and the butler would come with the colza oil lamps wound up and he would adjust the drip, but one did not live with the lamps. It was something of a disadvantage that we had to do so nowadays, and their appearance became of very great importance.



Drawing-room illuminated by Louis XIV. candle-brackets. (*Mr. A. P. Trotter.*)

Here came in the question of art. To many artists and architects and people whose business it was to produce beautiful things this was an appropriate and natural subject to discuss, but illuminating and other engineers had to try to learn in humility what they could on this important subject. He said "learn," but art could not be taught ; it could only be hoped for. In many subjects there were the laws of supply and demand, and as the demand arose so the supply was provided. In artistic matters, however, it seemed that the reverse should take place. We should have supply first, and, judging from what was offered us, we should demand what we liked.

The art of this country fell to its very lowest ebb soon after the exhibition of 1851, and twenty or thirty years later William Morris began to produce things which were so beautiful that they created a demand. It was impossible to lay down laws about these things. It must eventually be a matter of opinion, and the important thing was that public opinion should be instructed and guided to the right lines. The dogma that superfluous ornament should be removed was one which he could not accept. He would be very sorry to have everything denuded of superfluous ornament.

Coming to practical matters, there were, of course, very different requirements for different purposes. The old ball-rooms of our forefathers were lighted with magnificent chandeliers containing wax candles, and these were fitted as part of the design of the room. In our domestic life the lights we used when we received friends were obviously different from those which were used for every-

day purposes. On these occasions more light was required, but even here it was a matter of opinion. He had said on a good many occasions, and he repeated it, that for reading nothing was better than a shaded lamp, but Dr. Louis Bell, of America, and others held that this was entirely wrong. Indeed, Dr. Louis Bell had caricatured this question of shaded lamps. Every man, however, must judge for himself, and we could not lay down any laws or dogmas. When we came to the " style " of these things we were met with all sorts of difficulties.

The shopkeeper tried to teach us to go in for " period " furnishing. It might amuse some people to collect furniture for different rooms for different " periods " but many of us would be quite content with mixing the " periods " as long as the things were in themselves good. Electric lighting, of course, lent itself to adaptation of existing lamps in a most remarkable way.

In conclusion Mr. Trotter showed a photograph of a corner of his own drawing-room which, he said, Mr. Dow had very kindly taken for him the previous week. The room, he added, showed a mixture of styles for which he was not inclined to apologise.

Instead of the usual white imitation candles he used brass tubes coloured to match the old metal. The shades were opal glass ground on one side, and were larger than is usual with candle lamps. The object was to avoid glare by arranging that the brilliance of the shades was little, if any, greater than that of the white walls. He had some difficulty in securing this. The lamps themselves could not be seen from any part of the room. As a matter of fact, the lamps gave just about double the light that he desired, as he had the misfortune to be supplied at 200 volts continuous current. The lamps had to be connected three in series.

Mr. E. P. WARREN: At this time of external gloom and of the eclipse, temporary we may hope, of civic illumination, it is cheering to think and talk about internal lighting.

Mr. Thorpe has dealt largely with successive architectural periods, and seems to suggest—I hope to avoid and mean to avoid doing him any injustice—that architectural style, as we now call it, was —even in the earliest periods of its manifestation—self-conscious, and that coeval contrivances for artificial lighting were consciously kept in architectural subordination to the building fashion of the period. This was never the case, at any rate, in the early periods of development. Early Egyptian, Greek, Roman, Byzantine, Romanesque, or the successive mediæval phases, when there was no abeyance to prescribed fashion, to a revived or adoptive manner. The lighting contrivances (and I cannot accept the American-sounding and highly modern term of " fixtures " for the hundred unfixed lamps that were used for every one that was actually fixed) were evolved from sheer practical needs, tempered by the craftsman's artistry, and rendered comely and pleasant by the perfection of sheer fitness of form, and the ornamental fancies of the worker—always, of course, influenced like his brethren the contemporary masons, carvers, glaziers, potters and painters by the traditions of his craft.

The candlesticks, sconces, lamps and lanterns were as much the outcome of the conditions of their time, and the habits of their users, as the contemporary cups and platters, knives and spoons, spears, swords, ploughshares, boxes and barrels. They were not designed consciously in a style, and they have " style " because they have fitness and character.

Fitness and character—those are the qualities which in all matters of applied design we must strive for, if our workmanship in architecture—in the greatest as in the least of its adjuncts—is to be of any value or interest.

The abeyance to archæology, to archaic style in modern work is the great and constant danger. A man may be strong enough to override it, and to express himself with force and individuality in an adopted manner, as a man may express his ideas in an acquired foreign tongue, as Christopher Wren did, but such men are rare. The designer must think what a thing is " for " first of all, and with such things as appliances for electric lighting he should first and last consider form appropriate to the purpose in hand, then if he is designing for special positions in a special building he has not to

consider its nominal architectural "style," but its actual character and effect. If he is designing, as he generally is, "in the air," so to speak, he has to consider, after achieving fitness to practical purpose, a general adaptability to the shape and requirements of average positions in modern buildings.

If such designers can give simple, strong and graceful form, pleasant contrasts of surfaces, of curves and angles, to a thoroughly well-made piece of practical workmanship thoroughly adapted to the effective support and use of electric lamps, he need not have much fear of its looking ill in any sort of building.

There is nothing more pleasing than the contrast of manner arising from different periods of workmanship and different authorship of the various fittings naïvely added to old buildings.

Take as instances the splendid 17th-century "Spider" candelabra of churches, English and foreign, or the beautiful crystal chandeliers (18th century) in the Gothic parish churches of France.

Compare them with the self-conscious and expensive "Gothic" imbecilities of the 19th and 20th centuries designed "to fit in with the architecture," and hopelessly failing to fit in with anything whatsoever.

Let us be done with the perpetual confession of ineptitude, the laziness of always cribbing dead men's ideas and shrinking from thinking for ourselves, and in dealing with a new method of illumination let us, for goodness' sake, deal with it honestly.

It is dealt with quite honestly in many places where mere decent practicality is sought, and with results that satisfy any artist. The plain brass lanterns on shipboard and in corridor carriages are pleasing in design from their plainness, fitness and excellence. There is nothing offensive in the plain pendants used in unimportant bedrooms, and broadcast in offices, schools and hospitals.

There is, of course, no need always to be plain, but there is need to be sane. In copying old examples for modern use there are many dangers. The old lamps, lanterns and candle-holders of various sorts were made for the burning of oil, liquid in a lamp, congealed in a candle. The forms naturally evolved from these uses cannot be appropriate to electric light, which needs no receivers, no grease cups or retainers, but does need ducts for wires and sockets for lamps. That is one danger in design. Another and more serious is that, without very careful discrimination and scholarly knowledge, fearful mistakes as to the use of ornament may easily be made. I noticed in one of the lantern illustrations a four-light pendant "evolved" by copying the form of a Greco-Roman hand-lamp, probably a Tomb lamp of the early Christian era, and retaining in the copy a pierced circular disc containing the initials X. P., which are the Greek letters Chi, Ro, the initials of Christos, or Christ. A lamp bearing those initials might be appropriate in a sanctuary, but the suggestion appeared to be that this modern "evolution" could be sold for general secular use. Can you think a lamp bearing repetitions of these sacred initials appropriate to a drawing-room, a hotel lounge, or a club smoking-room?

Architects like myself are driven to using revivals and imitations, sham candles and the rest, because designers of fittings won't use their undoubted talents and skill to give us fine simple masculine form thoroughly suitable for electric light and at the same time handsome bits of handicraft, at the price or near them, for which we can buy the well-made imitations. In saying this I am not inveighing against designers of electrical fittings. The designer is not more to blame than most architects or anybody else, and architects, amongst whom I number myself, are perhaps the chief sinners. They are always harking back and copying. It is very necessary that the architect or the designer should carefully study the best things in order to find out and understand their real merits, the excellence of their workmanship and the charm of their materials; and probably it is better that they should at first copy a little, because they might come to grief if they did not; but the sole object should be to design a form which is appropriate to its use. Where it is a question of the evolution of new fittings for electric light there is a splendid chance, because this is an illuminant which is extraordinarily easily

used in some ways. Mechanically it is easy to introduce the wires; but, in one respect, electricity has resulted in the evolution of a most disastrous form of fixture, viz., the standard lamp. The wires necessary for connecting them are always getting into the way and causing trouble, and I really hope that something better than this will be evolved in order to avoid the unpleasant flexible wire.

In regard to the lighting of pictures, the ultra-modern system of lighting fine pictures by a long foot-light attached to the frame is a very bad one artistically. It is uncomfortable, because there is frequently far too much light on the surfaces of the pictures, which spoils the general effect of the room. Moreover, this light is practically useless to the pictures. I agree with Mr. Trotter that the lighting of ordinary rooms is largely a matter of individual taste. In a dining-room one man will want all the light concentrated on the table and the rest of the room in semi-darkness, whilst in a drawing-room one lady likes to have all the corners dark whilst another desires plenty of light in every corner. Artistically the happy medium is between the two extremes. In a room like a drawing-room there should be central illumination, or at any rate an illumination of a pervasive kind, as a stand-by which will really light the whole room, because light has a very curious effect upon people. If one goes early to a party and the room is badly lighted there is an excessively depressing and silencing effect, whereas if the room is brilliantly lighted this perks people up and they begin to talk cheerfully at once. With regard to public buildings or colleges and the like, the problem is an entirely different one. In a college dining hall of the type of those of the Oxford and Cambridge Colleges, there are generally roofs or ceilings of some individual character and, beneath them, pictures. The necessity here is to secure a pleasantly diffused light while preventing glare. I have tried various expedients, and prefer a certain number of pendants and a certain number of wall brackets. At one college in Cambridge I made a good many experiments and put up experimental fittings which I can only describe as a fishing rod with a lantern at the end. We had tried many other fittings from well-known makers, but decided at last to retain the fishing rods, as they seemed to give a better result than anything else. I put in a plea for common sense and for crediting architects with common sense. Architects are very often regarded as mere arbiters of style. An architect if he is going to do anything worthy of being considered serious architecture must design his building, from all points of view, for the purpose for which it is intended and is to be used. Therefore one of the things to do is to consider the building, while it is in plan, from the point of view of artificial illumination as well as daylight illumination. In this way one will be able to save a good deal of one's client's money, and a certain economy is effected, by predetermining the positions of the lights. For instance, it is possible to light two passages joining one another at a right angle with one light, if the matter is taken in hand properly, whereas on the other hand it is equally possible to arrange the one light so that only one passage is lighted. That is a very humble illustration of what I mean. With regard to the positions of lights generally, one of the most abominable arrangements is that which is apparently adopted in all British hotel bedrooms. There is a light over the dressing-table and another in the middle of the room, and why British hotel-keepers should adopt this system, which Continental hotel-keepers avoid, I do not know. The result is that if one wants to read in bed the pillow has to be put at the foot of the bed or else one has to read with the light right in the eyes; and when it is desired to put the light out it is necessary to cool one's feet in order to go to the door, where the switch is usually placed. This is a little point in comfort which, without one penny added to the expense, goes a long way to increase the comfort of the human species.

In conclusion, I have to thank Mr. Thorpe for his paper, and you, Mr. Chairman and gentlemen, for your kind invitation and your patience to-night.

Mr. J. S. Dow (Hon. Assist. Secretary) then presented a communication to the discussion from Mr. W. D. Helps (see p. 137).

Mr. Dow then proceeded to show a series of slides illustrating some American and Japanese fixtures. The first three illustrations were of unusual lamp-posts recently shown in the *Edison Monthly*. They did at least represent an attempt to design posts to suit the surroundings.

The other illustrations (Figs. 4–9 illustrating Japanese fixtures) were sent to Mr. L. Gaster some time ago by Mr. Ohya of Japan. The first two pictures showed some Japanese silk lanterns designed for use at the Imperial funeral of the late Emperor of Japan.

There was just as much need for scientific investigation with regard to gas fittings as with electric light; indeed, possibly more so, because although at present electric light fittings could be obtained of a fairly good design, gas fittings were at present often only to be obtained from an ironmonger's stock and offered a far greater scope for improvement in design.

With regard to the vexed question of whether we should copy or not, it would be obvious from the illustrations shown that evening how true artists, such as

FIG. 1.

FIG. 2.

FIG. 3.

FIG. 1.—Design to harmonise with "Old English" mansions in the vicinity. (Los Angeles.)
FIG. 2.—An interesting design drawn from the belfry of an old Spanish mission near by.
FIG. 3.—Standard in park made of greenish bronze to imitate colour of adjacent palms, &c.

The remaining figures are reproduced from a Japanese catalogue and are interesting as showing how that country is adapting its characteristic decorative methods to electrical fixtures. Some of the Japanese designs are very pleasing, the use of decorated silk for lanterns being very effective. The prevailing tendency in Eastern lighting is towards softness and mellow light, and it is to be hoped that these artistic effects will not be vitiated by the abrupt transition to the brighter illuminants of the present day.

Mr. P. J. WALDRAM warned the Society against the danger of drifting into the view that electric light is the only field for ingenuity in the design of fittings. the Japanese were, even if they began by copying, finished up by adapting the best of what they copied, and produced beautiful forms. He was quite sure that everybody must have been struck by one or two exceptionally fine pieces of simple and beautiful design in the Japanese examples which were obviously not copies but adaptations. In connection with that he would like to draw attention to a remarkably simple and effective type of electric light fitting for a church. That was at St. Jude's, Golder's Green, and was simply a large copper ring spreading a bunch of flexible wires, and at the end of each wire was a plain bulb lamp, without any attempt at shading. From the scientific point

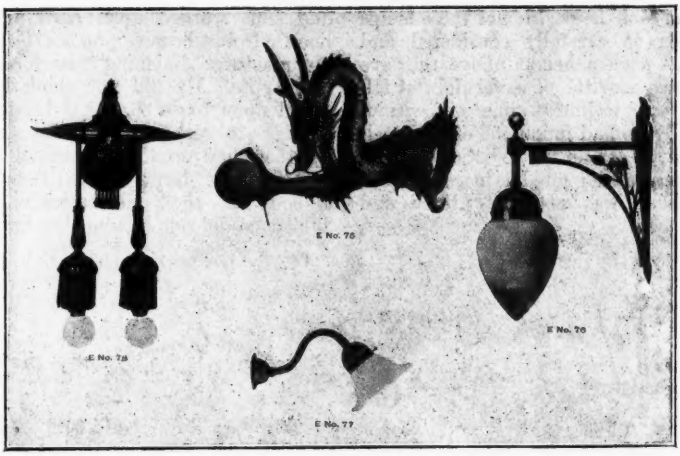
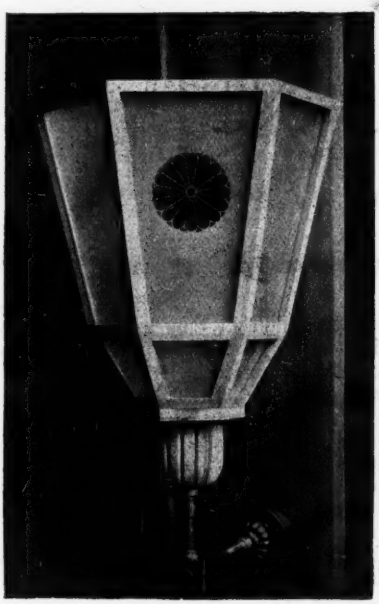


FIG. 5.—Note the interesting dragon design in centre.



FIGS. 6 and 7.—Japanese silk lanterns designed for use with electric light at the Imperial funeral of the late Emperor of Japan.

of view that should be too terrible for words on account of the glare, but as a matter of fact the position of these lamps had been so carefully considered and placed at such a height above the eye that lamps near the observer did not fall within the ordinary line of vision. Personally he had found the effect excellent, and, as far as the artistic side was concerned, nothing could be more pleasing, although it was absolute utility and nothing else.

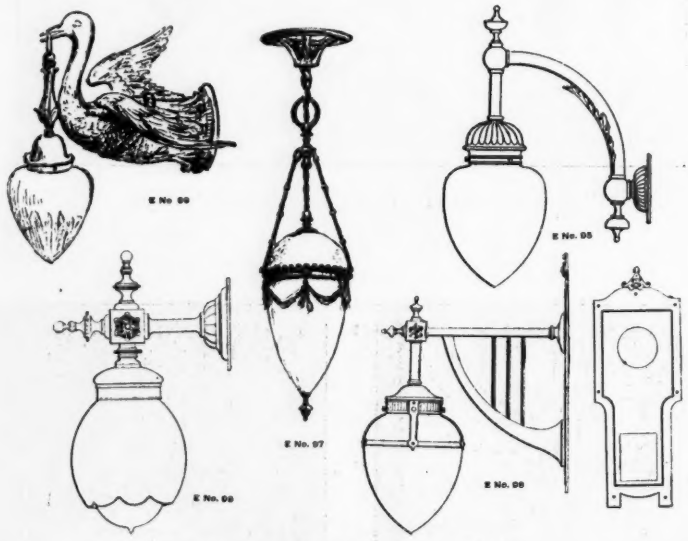


FIG. 4.—A page from a Japanese catalogue.

With regard to Mr. Thorpe's conclusion, that conditions in public buildings reflected the artistic sense of the nation, "thank goodness," said Mr. Waldram, "they do not." But those who designed the conditions in public buildings were responsible to the nation, whereas the designers of private buildings were responsible only to their individual clients.

Mr. C. H. BURT, speaking as a fittings manufacturer, who obtained his livelihood in conjunction with, or rather under the guidance of, the architect and the consulting engineer, remarked that most of the speakers had been inclined to blame the fittings manufacturer for having slavishly copied existing types and thus worked upon hard and fast lines. It was, however, no use the fittings manufacturer designing new forms and new types. He did not think he was called upon to do so, for if he designed fittings to his own ideas he doubted whether they would be accepted by the architects as forms which they could embody in their decorative schemes. Whilst he did not believe that architects would admit that they were themselves hidebound by tradition, nevertheless the successful architects were those who employed the classical details of bygone ages. It was fairly well known to those who had been speaking that the electrical fittings manufacturer must follow the work of the architects and designers of decoration. Unless the fittings manufacturer to-day could describe his fittings as belonging to certain accepted classical styles, he did not think he would continue to conduct a successful business.

A celebrated architect, Sir John Burnett, once said to him, "Mr. Burt, how do you account for it that with all

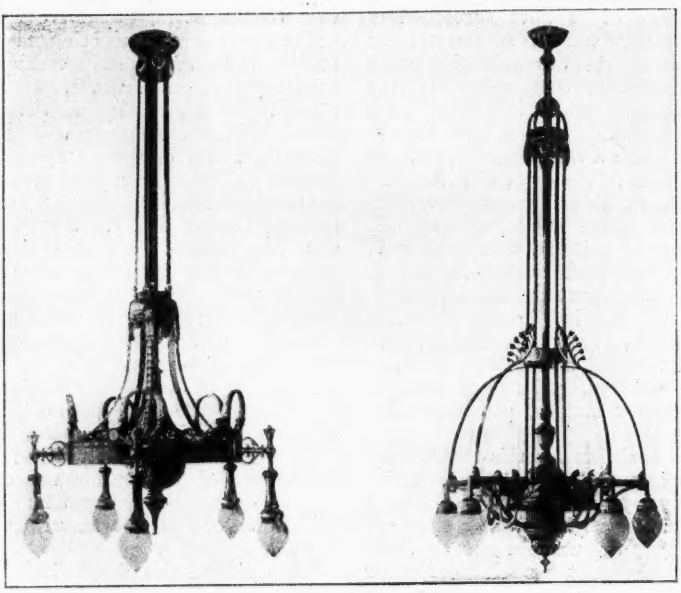


FIG. 8.—Adaptation of conventional electric fittings to Japanese design.

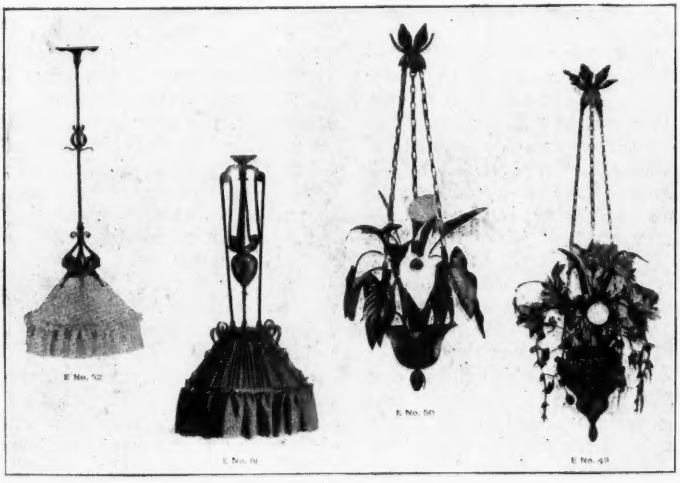


FIG. 9.—Note the use of imitated flowers and foliage on the right and the reproduction of ordinary Western designs on the left.

our modern architects and modern designers none of us have succeeded in evolving a form which is so graceful and acceptable to the discriminating client as the candelabra of the past and the electrical candle fitting?" This was a question to which at the time he was unable to offer a satisfactory reply, but he had come to the conclusion that the form of the candle being a simple vertical column is the one which best conforms to the law of uniformity or symmetry, and it is an accepted fact that the artistic effect of all symmetrical objects is improved by repetition and grouping, as for example, rows of architectural columns, avenues and groups of trees, lines of soldiers, pairs and sets of vases, rows of statues, panelled walls, etc., etc.

It was doubtless for this reason that the grouping of candles was 35 centuries ago discovered to be the most agreeable manner of multiplying a series of points of illumination of uniform intensity.

This is the most remarkable fact in relation to lighting fittings, as the record of the manufacture of candelabra dates back to B.C. 1491, when Moses was commanded to make a candelabrum for the ark upon certain specified lines, and this form of candlestick is still in use in every Jewish synagogue to this day (see Exodus, xxxvii. 17).

There was another successful form of electric lighting fitting which had come into vogue during the last year or two, and that was the dish fitting, the dish being composed either of a number of different materials which Mr. Thorp had already described as opaque, semi-opaque and in some cases transparent and of cut glass. He would ask the architectural members of the Society to bear in mind that the manufacture of decorative fixtures and fittings is handicapped by the practice of electrical engineers which had to be conformed to, namely, that the pressure or voltage at which the current was supplied for domestic use is not that which the fittings manufacturer would choose as the easiest for him to conform to. The introduction of metal filament lamps had very seriously added to his difficulties, because the voltage in vogue at the present moment was far too high for decorative purposes. The present day high-power metal filament lamps were too bright for decorative lighting, and efforts were now being made to provide some means for screening this brilliancy—in other words, to secure efficient diffusion. Many of the incongruous-looking fittings of to-day were either made for or were adaptations of fixtures which had been made for electric lighting under conditions which were not the conditions of to-day. When London was first lighted by electricity the voltage was 50. Then it was increased to 100 volts for the economy of the supply station; it was afterwards doubled to 200 volts; whilst the common practice to-day was 240—250 volts. The metal filament lamps on the top of that had more than doubled the length of filament which had to be accommodated in the bulbs and fittings, and by public demand the volume of illumination was on the average doubled or perhaps four times that which the fittings maker formerly had to provide for.

The various forms of electrical fittings which were now in most demand were those supposed, but not very correctly, to have been designed by the designers of furniture of the 17th and 18th centuries. There had been thrown on the screen illustrations of what had been called Chippendale lighting fixtures. That was a broad description, but in reality the so-called Chippendale fixtures were probably never designed by Chippendale. He was a manufacturer of chairs, principally, and a designer of decorative furniture, and he probably never designed a lighting fixture in his life. What was actually at the present time known as Chippendale furniture was designed by not less than seven different designers, and their names were to be found in most of the reference books. Then there were the so-called Adam style of fixtures, which were made at the time of the architecture of the Bros. R. and J. Adam. There were, however, many contemporary designers whose work was probably called "Adam style," but it was nothing of the sort. It was merely contemporary work and represented the current fashion of the day. If there were faults in the fashion of the time, or if the Adam style was pure or merely a resurrection of the classical designs and details of past ages

or otherwise, it was the result of the accepted taste of the time.

That must explain why the electric fixture manufacturers at the present moment were copying or reproducing or devising new fixtures in the decorative styles of the 16th, 17th and 18th centuries, and it is not their fault, if fault there be, that the public demand lies in that direction. The manufacturer has to conform to the demands of his market. It must also be borne in mind that the scope for new and original design in decoration grows constantly narrower with the age of the world, and it was to his mind doubtful whether future design would undergo any remarkable change from what is accepted as the classical form and ornament of the past.

Mr. J. G. CLARK showed some slides illustrating fixtures of a special character.

One slide (p. 134) illustrated the fixtures used in a French church in Soho. They were, he believed, the fixtures originally installed in the church and were retained when the lighting was modernised by the use of incandescent gas.

Another slide illustrated the simple fixture used for the support of incandescent gas burners at St. Mary's Church, Stoke Newington, a copy, he believed, of Salisbury Cathedral. Several slides were shown illustrating the lighting in the body of the church and in the choir, taken in both artificial and natural light, and it was interesting to study the appearance of the architecture in each case. An important point mentioned and

St. Mary's Church, Stoke Newington.
Incandescent gas illumination.

St. Mary's Church, Stoke Newington.
Daylight illumination.

Choir, St. Mary's Church, Stoke Newington.
Incandescent gas illumination.

Choir, St. Mary's Church, Stoke Newington.
Daylight illumination.

VIEWS OF ST. MARY'S CHURCH, STOKE NEWINGTON, BY INCANDESCENT GASLIGHT AND BY DAYLIGHT. (*Mr. J. G. Clark.*)

illustrated was the great value in church-lighting of light rays distributed above the horizontal plane from a relatively low position. With heavily-shaded units giving a preponderance of downward light, the beauties of church architecture are cast in gloom.

French Protestant Church, Soho Square.

I would like to take this opportunity of expressing my appreciation of Mr. Thorpe's paper. For those of us who have not given close attention to the æsthetic side of the question in its relation to pure architecture the paper will prove an extremely valuable work of reference.

Mr. PERCY L. MARKS: I should like to congratulate Mr. Thorpe on his interesting paper and to emphasise the desirability of co-operation between the architect and those engaged in the various specialised classes of work which together constitute "the perfect building."

The architect, who thinks he knows everything as well as, or better than, the individual scientific experts, is a snare to himself and a delusion to his client. Every architect should have a mastery over the plans and elevational design, and should have a competent knowledge of constructional detail, and should likewise have an intelligent appreciation of the sciences of lighting, heating, ventilation, and acoustics. If I do not include in the latter list sanitary science, it is because of the overpowering necessity existing that architects should specialise in this branch as in construction. The fact is, that the old name of "Master of the Works" more adequately conveys what should be the position of the one referred to, than does the term "architect."

As regards lighting, this must, I think, be regarded as an empirical science to a large extent, both in regard to artificial and natural varieties. It may be deemed to be at once subjective and objective, variable though limitative. The amount of natural light provided in any room through definite openings will not only vary according to the time of day, but also will be dependent upon the wall-coverings, the furniture, and other factors; we know how much lighter, for example, a room appears with the walls stripped to the plaster under the hands of the decorator, than it does under normal conditions; the draperies, too, are a potent influence. Therefore it is difficult to lay down any hard and fast rules.

But when we consider artificial lighting, we come into a region where I will confidently say that no architect ever devotes scientific research as to quality and quantity; he includes a "provisional sum" in the contract for "lighting fittings to be used or deducted in whole or in part, as the architect shall direct"; he specifies so many "points" in each room and corridor—and then, consults a catalogue; that this method has lasted so long speaks eloquently for the sheep-like nature of the public. Personally, I think that the closer the approximation of artificial illumination to the appearance of natural lighting, the better; and finally I have no hesitation in saying that for all buildings, except where the most rigid economy is required, the co-operation of various experts should be invited, and I am indeed inclined to believe that this would actually prove more economical in the long run.

Mr. A. E. PENN endorsed the previous speaker's desire for co-operation between the three individuals mainly responsible for a building. The difficulty at the present moment was to get professional gentlemen to take into consideration that we are now undoubtedly living in the age of specialisation, and that it is not possible for us to be all perfect in so many phases of such an intricate subject. Illuminating engineering has now become

a science in itself, if it never was before, and the time had come when all should freely co-operate with one another and give the advantage of each other's specialisation for the benefit of the common object in view. That seemed to be the aim of the author in his paper, and if it could be achieved he thought we are undoubtedly in for much better times than had been experienced in the past.

The CHAIRMAN (Mr. Frank Bailey) :— The demand for a high standard of illumination and the use of lamps of high candlepower, or at any rate of a higher candlepower than was formerly used before the introduction of modern illuminants, and the certainty that the tendency will be to use lamps of from 100 to 1000 c.p. at no distant date, compels us to revise our notions regarding the type of fitting or fixture we are accustomed to associate with the use of artificial lighting. We should remember that the fitting is not necessary for the lamp; the lamp can be complete in itself, and it can be placed anywhere—suspended from a cord or fixed to the ceiling. The purpose of a decorative fitting is therefore more difficult to define as being absolutely necessary for the particular work to be carried out, and there is a danger that by adhering to the old notions of what is appropriate we may reach the stage when the fitting requires to be illuminated, and the room to be lighted becomes of secondary importance. The revolt against so-called artistic fittings is shown by the craze for cornice-concealed lighting, and also to some extent by the various methods of securing indirect lighting; although in many instances of this kind we see examples of the need for illuminating the fitting itself, as the author of the paper has shown us a lantern slide illustrating the benefits of illuminating the under surface of a bowl used for indirect lighting. If these methods are carried out to a logical extreme there is no reason why such fittings could not also serve a double purpose and be used for plants and flowers during the daytime. We must admit that many of the old designs, standardised by their excellence and hallowed by the traditions of ages, were more suitable for the particular illuminants then available than for the requirements of the present day. We cannot always live with the wax candle, or the imitations of it which degrade modern lighting. We have grown to require more light, and find that we can get it without inconvenience of dirt or smell, or vitiation of atmosphere, and at a trivial cost. We must therefore either do without any fittings or conceive something which will carry a lamp of little or no weight, and do this without any appearance of triviality. If, on the other hand, we can consider the amount of light as equivalent to weight, then the artist can get to work on a substantial design of some solidity.

The Author of the paper has mentioned the desire of the architect to admit plenty of daylight by providing ample window capacity, and it may appear desirable to utilise this wisdom by placing lamps outside the windows and thus obtain direct outside lighting. With a desire to secure some economy I have attempted this method of lighting an interior, and I hoped to light an approach to my house simultaneously with giving a light from outside into rooms and staircase, &c., but the effect is not pleasing and seems unreal, although it has one advantage that the windows are kept reasonably clean; but it also has a distinct disadvantage, as during war time the police object to its continuance. Perhaps a better plan would be to arrange inside lighting for outside use in cases where there was anything worth looking at, such as the stained-glass windows of Westminster Abbey and other places.

The Author, in mentioning design of lamp-posts for street lighting, does not point out the necessity for securing a high elevation. Artistic embellishment of such structures becomes a hazardous operation, for experience has shown us that dangerous projections, necessary apparently to secure artistic effect, have an awkward habit of hitting one on the shoulder or perhaps knocking one's hat off. The finest example of a lamp-post in London can be seen in Trafalgar Square, where the Nelson Column is simply wasted, and a statue we all want to see is placed far out of the reach of normal vision. This could easily be altered by

placing lamps at the top and putting Nelson on a pedestal below.

Mr. F. T. CASH (*communicated*):—Mr. Thorpe's admirable paper read on the evening of the 16th inst. is of a very illuminating character. Had illness not prevented me I should have been delighted to add my personal expressions to his upon such a vitally important matter.

The art of designing is inherent in the human race, and would appear to be a prior expression of artistic activity to that merely imitative art which later grew to such preponderance that the art of the designer, and eventually the designer himself, became almost submerged under the vast mass of pictorial effort. Such effort in the course of time has attained a greatly exaggerated value, but your Society would not appear to be of a nature to which one should deliver an address on the genesis and organic attributes of design; hence I confine the following remarks to that aspect most closely in touch with the aims of the Illuminating Engineering Society.

In considering domestic or public lighting the designer of fixtures should bear in mind two great cardinal principles, to wit, contour and picturesqueness. The most perfect design is one that does not obtrude itself on the mind, which can only receive its impressions through the eye. It should sink into just proportions with its surroundings; weight, size, colour and detail should never detach the fitting from the scheme. Its detail, should one desire to examine more closely, should be such in weight and balance that it can be appreciated instantly. More detail than may be comprehended in a cursory glance must appear out of place in the scale of a fixture suspended well above the eye level, hence the insistence upon contour and picturesqueness, which values should equally satisfy alike the connoisseur and the uninformed. To illustrate my meaning I would draw your attention to that class of candelabra of the Dutch and Flemish School, together with its English development on similar lines. In such candelabra the principles to which I refer have full illustration. The multiplication of the simple sweeping arm gives a contour which is immediately picked up by the eye. No matter how multitudinous the arms making up the number of lights, the scheme is graspable. Should one desire a closer inspection the several parts that constitute the whole are found to be agreeable in themselves. The massive baluster body of varying outline holds the light and shade, and by reflection of the arms in itself creates its own richness and wealth of detail. The nearer any design in any style approaches these two principles the more satisfying and successful is the result.

I wish next to draw your attention to the wonderful creations of the designer covered by the periods Louis XIII., XIV., and XV. In lighting fixtures, as well as other decorative articles of domestic utility, each period represents the embodiment of cardinal principles with local differences of expression. I particularly draw attention to these periods, because so far as I can perceive they are the last expressions of simplicity, breadth, and strength. To me nothing is finer than the noble scale of the best work of the Louis XIV. period. Breadth of detail, strength of line, bold contour, and strong execution result in a perfect "tout ensemble." The later designers deserted these broad and pleasant ways, and became more and more addicted to using a wealth of fine detail with marvellous execution, the resulting product gaining in fineness but losing its true scale value. To some considerable extent the lost feeling was recovered by our designers working in the Queen Anne and earlier Georgian periods, after which the later Georgian and then Victorian deluge with its utter abominations saw the light of day. Not the least distressing feature of this desolation was the supplanting of the artist creator and artist patron by the modern commercial system with all its attendant horrors.

Lest the immediate foregoing remarks should be misunderstood, I imply by them the loss of that genuine spirit which animated our further forbears and the substitution of an uncaring, uninformed, purchasing public; and until we come to understand the height, depth, and breadth of all that is implied by the word "education," the world of design will still be governed by the stridently powerful, uneducated, and I fear me uneducable Philistine.

Mr. W. D. HELPS (*communicated*) :—It is an indisputable fact that the method of producing light from gas has to a certain extent influenced the design of fittings. The flat-flame burner, the first type used—and the nearest approach to burning the gas at the end of an open pipe, as was done when gas was first discovered—was, and is, in itself such an insignificant contrivance that it always looks out of balance with the best proportioned fittings. The upright Argand Burner which followed was a trifle more imposing in appearance, but it did not lend itself to a particularly artistic arrangement owing to the length of glass chimney essential for its good working. Next we had the regenerative lamp, which, in some of its types where Doulton Ware body was used, was more or less ornate and somewhat heavy.

The introduction of the upright Incandescent Burner did very little to improve the fittings on which it was used, and we had to wait for the Inverted Incandescent Burner before any marked improvement in the design of gas fittings was possible. This inverted burner lends itself to lines and schemes that were impossible with the upright types, and owing to the fact that it could be made of very small dimensions it will harmonise with fittings of much lighter construction. The fact that gas was first burned at the end of an open pipe is probably the best indication of the causes of the slow progress made during, say, some 80 years during which gas was used. The bulk of the fittings made during that period were simply adaptations of the original method of burning gas, very little initiative or ingenuity being displayed in designs.

Probably the introduction of electric light had far more to do with the improvement in the design of gas fittings than any other single factor. The electric lamps could be used in any position ; they were wind-proof, did not give off any great amount of heat, and the wires necessary for carrying the current were of the smallest dimensions. In the gas fitting the bulk of the metal work was looked upon as necessary for conveying the gas to the burners or for supporting shades or globes. With electric lighting the metal work was considered more by way of ornament than of serving any useful purpose, and it is quite natural that with the introduction of these lightly constructed electrical fittings, the designers of gas fittings should in turn set about to see in what way they could reduce the weight of, and improve the appearance of, such fittings as are used for gas. The introduction of the Inverted Incandescent Burner gave them their great opportunity, as with the burners in a pendant position they were able to introduce fittings that closely resembled the electric light fittings in appearance. The public also had a hand in the matter, as they in turn demanded gas fittings that were equal to the electric light fittings in appearance, and consequently designers with initiative were soon in demand.

The result is that to-day gas fittings are obtainable that do justice to any setting, and fit practically any scheme of lighting that can be imagined. To some extent the waste heat from gas burners was a source of trouble to designers of fittings, owing to the fact that it tended to discolour the high-class burners, which emit the waste products in such directions that they do not affect the fittings. On the other hand, use had been made of the potential ventilating effect of this waste heat, and we now have exceedingly ornate fittings that are fixed directly on to the ceiling and which, in addition to giving a very even illumination, utilise the waste heat from the burning gas to create a powerful ventilating effect. These burners are now largely used in churches, public halls, large offices, &c., with a very good effect.

For indirect and semi-indirect lighting electric light for some time held the field. The designers of gas fittings, however, soon overcame the difficulties of adapting gas to this form of lighting. In those fittings where the bowl is suspended by chains from the ceiling, the gas supply is carried to the burner or burners, which are not visible from below, by means of a flexible metallic tube looped through the chain. Burners were designed that would lie snugly inside the bowl, and there are to-day numerous very artistic semi-indirect gas pendants on the market.

Some features in which progress comparatively recently has been made are :—the introduction of small Upright Incandescent Burners forming imitation candles

for use on period fittings; the use of silk and bead shades; the introduction of rise and fall pendants other than the old water slide type, and the introduction of compact contrivances which enable gas to be switched on and off exactly as is the case with electric lighting.

The rate of progress during the last ten years has undoubtedly been much greater than at any other period in the world of science, and I think that this fact, coupled with the introduction of electric light, is responsible for the great progress made in the gas industry.

Mr. W. F. T. PINKNEY (*communicated*):—Mr. Thorpe has lightly and skilfully touched on many points covering a very large field, and any one of these points merits long discussion.

Of particular interest are Mr. Warren's remarks, and it is to be regretted that his opinions are not held by a greater number of his brother architects.

The indifference exhibited by a large number of architects to illuminating engineering is really extraordinary. It is a very common thing for an architect to design a building and to hand plans to a lighting engineer and ask him to prepare estimates for the lighting of such building, the cost not to exceed so-and-so (generally an inadequate amount), and no mention is made of the positions of the lights or the design of fittings.

It seems to me that this would have its parallel if the architect were to design the building without windows, and were to ask a glazier to give an estimate for installing windows, and the cost not to exceed a definite amount.

No architect designs his building without giving a careful consideration to the placing of the windows and the daylight illumination, and it is just as important that an architect should consider his artificial illuminations in the same way, and yet I know that it is not always done; in fact, I believe it is very seldom done.

I am quite sure that if all architects were to give more attention to the design of artificial lighting, and were to study illumination in the way it ought to be studied, they would then become more competent to design fittings of a decorative and efficient modern design to conform with modern architecture.

There are three classes of profession to which a fittings design is of great importance:—

1. The architect who generally lacks a knowledge of illuminating engineering.
2. The fittings designer, who is mostly concerned with what will appeal to the public (and who for this reason at the present time has to pander to the prevalent fashion of the antique), and who understands the requirements of the illuminating engineer, but does not always conform to his wishes.
3. The lighting engineer, who knows how to place his illuminations to get the most efficient lighting result from the point of view of brilliant illumination and small lighting bills. He, however, is scarcely qualified to tackle a question of design in relation to modern architecture.

It seems to me, therefore, that if the architect were to include in his curriculum of training a course in illuminating engineering, he would in time influence for the better the design of lighting fittings and all efficient illumination.

Mr. Trotter rather took exception to the word "fixtures." The lighting fittings have for almost all time been fixtures, and even the movable standard lamp is not used as much as it was some years ago.

Mr. Warren indicated the objection to flexibles, and practically asked for wireless transmission, in order that the chief objection to standard lamps might be got over. I am afraid we cannot look for that at the present time, but I venture to think that in domestic interior illumination much more use will be made in the future of the standard lamp and less of the wall and ceiling fixture fittings, as undoubtedly the mere fact that most fittings are fixtures is a great drawback.

Mr. Burt stated that the fittings designer experienced difficulty due to the present high voltage generally in use on Electric Supply Authorities' mains, for the reason that it was generally necessary to use high candle-power lamps. It is, however, quite possible to obtain low candle-power lamps for 200 to 250 volts, although these are not stock sizes and generally have to be ordered from the makers, but if the fittings designer were to create a demand for the low candle-power high voltage lamp, such lamps would very soon become stock lamps.

Mr. W. H. HOWLING (*communicated*):—Being an interested and appreciative listener to Mr. Thorpe's paper and the subsequent discussion on Tuesday evening last, I am inclined, with your permission, to put on record some thoughts that came to me during, and since the meeting. The art of design necessarily leads one on to debatable land, and the path of the designer is not inevitably smooth or level. Criticism, he finds, comes to him from people who may or may not be qualified to pass an opinion. Should he, in designing on the accepted lines of a "style" or "period," infuse too much individuality into his ideas, he is probably accused of "incorrectness." By the same school of thought he may be termed a "copyist" if he errs in the other direction.

Art being more or less constantly in the process of evolution, it must therefore follow that what meets with approbation to-day is, on the morrow, regarded with doubt. It is a far cry from the giants of Gothic and Renaissance times to the present day, but out of the continually varying phases that one notices now, it may be that some feature, at present unrecognisable by ourselves, will be hailed by our children's children as a conspicuous landmark in history.

The modern designer, especially if engaged in commerce, has to cater for a *clientele* of varying taste and capacity, he has therefore to be adaptable. My object in writing being the provision, in some measure, of food for thought, I will conclude with a quotation from Ruskin's "Seven Lamps of Architecture":—

"Frankness, however, is in itself no excuse for repetition, nor Audacity for innovation, when the one is indolent and the other unwise."

Mr. WALTER GILBERT (*communicated*):—In following Mr. Thorpe through the very interesting dissertation he has given on lighting, the point which particularly strikes me is—how comparatively easy a problem the old masters had in lighting to that which confronts us to-day. We must admit, however, that they accomplished their task thoroughly; their work was architectural—sound in construction, and their design exactly fell in with the materials necessary to obtain their luminant.

Their illuminants of oil or grease were concrete materials, and they evolved their fittings in a proper way by building their metal work and their woodwork round these essentials for their light.

This act of the old masters of lighting gave them inspiration in their methods of design and quickened their imagination, for their designs for lighting by oil are quite distinct from those they adopted for lighting by means of soaked wood rushes or grease.

To-day we are troubled with a plethora of materials and methods, so much so that we cannot make up our minds what scheme to adopt in making our designs. This plethora not only troubles us, but, what is more important, troubles the purchasing public. There are so many voices, each more or less shrill and insistent on being heard, each keen to give advice or express views, all excited owing to the amazing miracles of the inventions of these comparatively new lights of gas and electricity, that the designer has not yet been able to determine the true spirit of the luminant. He has turned candle fittings into gas fittings, and gas fittings into electric fittings.

I think, however, he realises that he has not yet done his part, for gradually he is becoming more courageous, and from having hung the electric bulb on to a piece of cord, he now by way of America rests the bulb in an alabaster saucer strung to the ceiling. I must say too that he seems very well pleased with himself at the thought that he is on the road to the discovery of an artistic and successful scheme of electric lighting.

There is no sounder axiom in art than "Study the old work," but this axiom has been the cause of delaying by many years successful modern lighting.

It has caused men to be content with the easier task of "cribbing" forms instead of evolving them—to work without thought instead of with imagination.

In lighting the American is far in front of us in this respect. Though in architecture there is no one to-day who more religiously copies old forms, in lighting there is no one more ready than the American to use his imagination either in the lighting of a room, a bar, a lounge, or a sky-sign. Their street lamps more

aptly fit the method of illumination than those I know in any other country.

The American understands that lighting, particularly electric lighting, gives him a power of appealing to the dramatic, the picturesque, or the splendid. He will light a dining table in such a manner that you will be able to see the dewdrops on the flowers, or make the table fountain (as in the Blue Room in the Casalle in Chicago) appear to you to have been stolen from Aladdin's Cave. He will hide his lights in blocks of frozen crystal or secrete them in vases of glowing alabaster (Morgan Library, New York); he will drop them as pearls hanging from trophies of the chase or the sea (Astor Hotel, New York), or smother them in baskets of luscious frozen fruits of glass (Windsor Hotel, Montreal).

I hear some rumours suggesting this to be bad art, but I personally do not see why a clever treatment of fruit in glass should be worse art than the treatment of ivy and finish of ivy in the round planted on the sides of the silver vessels of Roman origin which are considered to be among the treasures of the world in the Imperial Treasury at St. Petersburg.

This, then, is my text to the designer: Look upon the light as a jewel—dress and arrange the jewel as Holbein arranged his jewels, remembering that the jewel is the paramount feature, the setting to be subservient to the jewel and the jewel to be for the glorification of the person. The light-giving part of the fitting should be the predominant feature, the setting itself may be plain—it must be unobtrusive and subservient to the light-giving part—but the whole must be the jewel of the room.

Twenty years ago one man in England more nearly solved this idea, as any visitor to the late Sir Hubert von Herkomer's house at Bushey can confirm; if we advance with this thought in our minds I am convinced that we shall make a straight stride out of the somewhat stagnant pool in which we are to-day, towards a really defined and artistic period of design in lighting more in accordance with methods the wonders and advantages of which never in his wildest moments could have been deemed possible to the imagination of the old master.

Mr. H. T. WILKINSON (*communicated*):—I have read Mr. Thorpe's paper with much interest, and think it will do a lot of good. I am most interested in his remarks under "Modern Developments," and am of opinion that much may be done in the way of adapting old designs to modern requirements, thus embodying a beautiful appearance and efficiency in illumination. I think the present tendency is towards beautiful lines and proportions rather than detailed ornament. This, of course, applies more particularly to the industrial kind in general, and for modern room or office in particular.

I was over in Paris about two months ago, and was much interested in the electrical fittings used there. They are generally of the types profusely ornamented, and particularly those with festoons of prismatic glass. These in my opinion were all very well for the days of candles, but with modern high candle-power units they are altogether too dazzling.

They do not seem to have developed the indirect or semi-indirect methods as much as we have, and seem to adhere rigidly to their period styles.

The street lamp pillars in Paris are very fine, and it would add considerably to the beauty of our streets if we were not so painfully mechanical in our designs. I hope that borough electrical engineers may read Mr. Thorpe's paper, and take a lesson from it.

Again I would repeat that I think Mr. Thorpe's paper will do a lot of good, if it only induces designers to pay a little more attention to the desirability of embodying beauty and form, with efficiency, in modern fixtures.

Mr. MONTAGUE H. GALSWORTHY (*communicated*):—I was unfortunately unable to be present when Mr. Thorpe was reading his paper on Lighting Fixture Design to which meeting you so kindly invited me, and it was only late yesterday I was able to get any time to read through his most interesting paper.

I think in connection with the Antique Boat Lamp, a point which is generally overlooked is the fact that it not only had an artistic appearance but was in olden times quite an efficient shape as

regards the lighting, that is to say that a container to carry the oil had to be embodied in the design and instead of placing this immediately under the lamp, which would to a certain extent blot out the light from below, people in those days were sufficiently ingenious to shape their lamps so that the actual burner came out at the end, avoiding shadow to a large extent.

There is no doubt that as regards period design the Flemish has held its popularity longer than any other particular style, chiefly in my opinion, due to its great simplicity. Such styles as emanated from the Brothers Adam, Sheraton, &c., have been revived from time to time of late years, and gone out of fashion again, due in a large measure to being overdone, and of late years especially has this been the case, having been absolutely killed by cheap and tawdry imitation. For instance, in cheap cabinet work as also in electric fittings it is only necessary to see a wretched so-called ram's head or a swagg with bows applied to some portion of the work to apparently justify the maker styling it Adams. Other periods coming into vogue in their turn have been killed off in a like manner until it makes one tremble to mention particular styles, unless you are dealing with an actual copy of some old piece made in the period in question.

I notice that the author states that most of the fine examples of glass work come from abroad and that the war is affecting this particular industry. I do not think he is correct. I should rather have said that the cheapest glass has hitherto come from Germany and Austria, and it is that particular glass that at the moment is not obtainable. I only wish that it might continue to absent itself from our markets. There is no doubt that some of the best glass work is carried out in this country. Unfortunately, from a commercial point this is greatly hampered by the workpeople themselves, who seem to be the masters in place of the employers.

I cannot see that there should be any objection to the use of electric or other modern illuminant being used in connection with Old English period fixtures. If the Brothers Adam were alive to-day they would have no hesitation in making use of the modern electric candle or other lamps. It was only that they had no better form in their days than the wax candle from an artistic point of view, which caused them to lend their designs to that particular illuminant. The modern candle has a very soft and beautiful effect when lit and properly shaded, but I have come across many architects who taboo the imitation candle on account of its not being the real wax article, which after all caused a good deal of trouble due to wax dropping on to the floor. I am glad to find that a good deal of such prejudice has died out during the last two years. It is only another instance of our very conservative nature.

As regards semi-indirect and indirect lighting, this latter form never seems to me satisfactory. There are many instances of large shops and halls lit indirectly by metal bowls, suspended at intervals throughout the premises, and one never gets away from the impression of a number of dark blots in the general illumination, whereas in the semi-indirect form when properly carried out there should be sufficient reflecting power from the bowl to the ceiling combined with a certain soft light coming through the bowl itself. By this means a very restful and sufficiently brilliant form of lighting is to be obtained.

I do not think that the author has sufficiently alluded to the real cause for the modern demand of this form of lighting which is attributable to the high efficiency of the modern lamp, by which it has become practicable for people of moderate means to use this particular method of illumination, which a few years back would have been prohibitive owing to its costliness.

The use of alabaster for Domestic Lighting has been very popular of late, and I venture to think that it has come to stay. This material is not fit to be used in connection with gas, but there is no such trouble in using it with the Metal Filament Lamp, provided the lamp does not touch the alabaster, and I think that with this form of lighting, in spite of the author's remarks, there should be no difficulty in treating the illumination of old manor houses in the Tudor or other periods, the metal mounts of such fittings being carried out to correspond

with the style that has to be dealt with.

In regard to shop fronts, which the author does not seem to have alluded to in any direct manner, there is no doubt that the best form of lighting is that which throws the light on to the goods without being seen from the street. The writer wonders that this method does not become more popular than appears to have been the case. To look on a blaze of lights inside a shop not only is distracting to the eye, but takes one's attention off the goods exhibited in the window. The general idea no doubt hitherto has been to make a blaze of light in order to attract the public. If a strong illuminant must be obtained then it should be carried out in such a manner above the shop window as not to interfere with the interior of same.

In conclusion, I would like to congratulate the author on the large amount of information which he has handled so ably in his paper and the manner in which he has dealt with such a difficult subject.

Mr. A. P. LUNDBERG (*communicated*) :— Mr. Thorpe's paper is very interesting and well illustrated, but it does not touch on one point, viz. : the control of the light. This is a matter which has undergone even more wonderful changes than the designs of the fixtures ; and it is also a matter which has been very little investigated by those most closely concerned.

There are still some people who, of their own free choice, prefer wax candles (not to mention oil lamps) ; and the only control possible with them is of the laborious point-to-point order, viz., individual lighting and extinguishing.

I would suggest that if architects, consulting engineers, and contractors were to give some attention to modern lighting controls—multipoint, variable, restrictive, pilot and so forth—they would find that the advantages and conveniences of electric lighting are immensely increased thereby.

There is nothing mysterious about these improved controls : they are not costly, and they form a logical utilisation of the properties of the electric system. In fact, I will go so far as to say that no electric-light installation can be considered satisfactory till every consideration has been given to the manifold advantages of efficient illumination and convenient switching.

Mr. F. W. WILLCOX (*communicated*) :— Mr. Thorpe deserves our thanks for giving us such a concise summary or bird's-eye review of fixture design. He has made a difficult subject interesting by not limiting his discussion to the purely architectural and artistic features but by bringing in the utilitarian and practical points as well throughout.

I heartily endorse many of these practical points of his—in particular his remarks on the harm done by the failure of the architect to secure effective lighting arrangements for interiors of public buildings. It is particularly important that the artificial lighting of buildings should secure every attention in a climate like England's, where artificial light is required for such a large part of the working day in the autumn and winter season. It has always been an anomaly that an architect or owner of a building should expend so much skill and inquiry on interior architectural designs, and then leave the lighting of it to be so miserably and inadequately done.

London is full of buildings such as St. Paul's and many of the Government buildings in Whitehall, as well as office buildings and shops, that suffer lamentably from exceedingly poor lighting arrangements. The buildings suffer as well as the people who visit or occupy them.

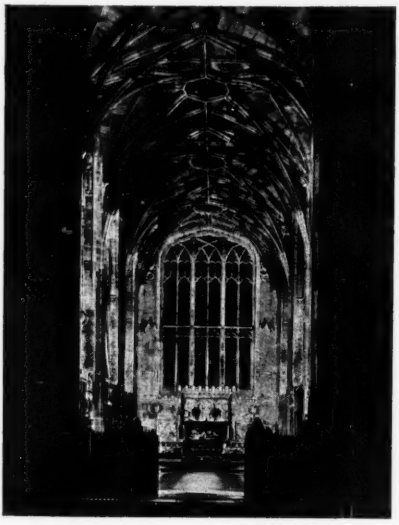
In respect to fixtures generally a reading of Mr. Thorpe's excellent paper leads me to consider whether the time has not come when we are to depart materially from the cult of the lighting fixture itself.

A brief explanation will indicate what I mean.

The essential intention of a lighting fixture or fitting is to provide a suitable support or mounting for the illuminant. The original design was thus determined by the early illuminants, which were flame illuminants, and therefore had to be supported in an upright position well below the ceiling.

Now the trail of this idea—what I may call the " fixture idea "—has been over

the lighting industry ever since. The introduction of the electric light—the flameless illuminant—has completely altered the original requirements. A considerable part of the time since the introduction of the electric light has naturally been given over to adaptations of the previous existing fittings and ideas to this system of lighting; but the time has come when, with the wide employment of electric light, the old-established fixture or fitting idea must pass. There are already widespread indications of this change, particularly in the newer countries such as the United States and Canada. In general it may be said that the central type of "arm fixture," as it may be called (*i.e.*, fixture with arms or branches),



Modern Lighting without Fixtures.

Concealed lighting of church chancel showing how the architectural details can be portrayed and a perfectly natural lighting effect secured.

is becoming obsolete. Its place is being taken by some form of a bowl—either glass (semi-indirect) or metal in plaster (wholly indirect). Such an evolution is being hastened by the improvements in efficiency of the incandescent electric lamp. These latest lamps, such as the "half watt" lamp, have a very great increased brilliancy, and their proper use compels some form of indirect lighting.

Let us agree that branch arm fixtures should form an essential part of any architectural scheme where the character of the illuminants (flame-type) or any other practical necessity requires the use of such a fixture. We must, however, depart from the fixed programme that the fixture idea must form a part of every architectural scheme or construction and that everything—form of illuminant, method of use—must be subordinated to the fixture. We must not be bowed down to always consider that a fixture, for example, must be suspended from the ceiling somewhere about the interior. We should not consider, in other words, that a fixture is necessary purely as a piece of furniture in any part of the room such as a door or chair. In the case of electric light that time has gone by. Modern lamps and methods no longer require the use of the primitive idea of a suspended candelabra or bunch of metal arms in the centre of the room. Furthermore, the high brilliancy of the latest electric lamps (the economical working of which will compel their adoption) require such radical modifications of the existing fixtures as to suggest their entire elimination in the case of many interiors.

To employ invariably old arm fixtures encumbering the centre of a room, purely because such fixtures were a necessity of the period in which the room is designed, seems to me to be placing modern developments and advances under too heavy a restriction; and some of the modern lamps are too brilliant to permit it. It would seem to be on a par with requiring that the old water-clocks should be used in place of modern timepieces in analogous cases.

It seems to me, therefore, that the time has come when period designs in fixtures should be subordinated and that the requirements of the most efficient lamps will produce such difficulties and anomalies in the use of period fixtures as to eliminate the fixture entirely.

I might elaborate on the benefits that will be gained both architecturally and artistically by the removal of the heavy fixture from the centres of many rooms and interiors. The advantages to the art of illumination and the benefits in improved lighting will be very marked

as illuminating engineering has always suffered from the trail of the fixture over the industry.

The passing of the fixture would leave us with a clear ceiling and unobstructed space overhead. It will increase the vogue of natural and unconscious lighting and concealed lighting in all its forms; it will achieve the elimination of glare and all the derived evils of bad lighting; will diminish the tendency to bad eyesight and nervous troubles due to unsatisfactory lighting conditions; and finally will lead us away from the too slavish following of old period designs. All this will come about when the art of interior illumination is freed, as it should be, from conventions of style and period.

Mr. F. W. THORPE (in reply):—The excellent discussion on my paper has turned mainly on the true relationship between the practical and the æsthetic, in design. From the teaching of men like Ruskin and Morris, these principles are well known to every designer. But the fact remains that he is prevented from rigidly practising those principles, by the prevailing want of knowledge of his clients, for whose requirements he has to cater. Nevertheless, it does not follow that the designer is necessarily a slave to that ignorance, nor content to have it so.

It has been suggested that the only way to overcome these restrictions and obtain independence of thought is to provide something better, ignoring the claims of the unenlightened. But it may be pointed out that the policy of "splendid isolation" is only possible to an independent artist who is unembarrassed by considerations of £ s. d. We cannot ignore the changed conditions represented by the fact that objects of art are now produced on a commercial basis, and have to meet the requirements of an undiscerning majority. The designer practising idealistic principles would find the smallest possible market open to him. He no longer works for a small circle of "patrons"; nor in these democratic days would we desire it. His field is now the public—in fact, the world.

His mission, then, is firstly of a checking nature, and secondly, educative, and this, like every other form of education, is gradual. We have evidence that this education is actually in progress by the great improvement in fixture design during the last few years. And we hope to carry on the work.

Much has been said on the compromise between efficiency and artistic effects These aims are not necessarily conflicting; many of those who criticise period fittings have apparently in mind obsolete types, such as no good designer would produce now. Similarly, one would naturally aim at congruity with surroundings, and my remarks on adherence to old models do not imply that I advocate retaining their defects, or approve of certain designs for indiscriminate use amidst modern surroundings. The lamp illustrated embodying the sacred monogram is not, as Mr. Warren seems to suggest, put forward for general use. It is not usual to attach religious symbols to objects intended for secular use.

Turning to modern tendencies in design, it is surely a mistake to advocate the use of one system—direct, indirect or semi-direct—for every purpose. The best installations are those in which the lighting system is adapted deliberately to meet the needs of the interior. Those who criticise the retention of period fittings and advocate indirect lighting should also bear in mind that this system involves waste of light and is, in a sense, a confession that the modern lamps frequently yield an inconveniently high candle-power and brilliancy and that the engineer has not yet succeeded in developing the ideal lamp for purposes of illumination.

Nor should it be too rashly assumed that the ideal in artificial lighting is to simulate daylight. Artificial illumination has a charm of its own and it is surely questionable whether it is desirable either from the artistic or physiological standpoint, to imitate natural light exactly.

Finally, I must thank those who have joined in the discussion for their kind reception of my paper.

ERRATUM.

Illuminating Engineer, Feb. 1915, pp. 72–75, for "H. H. Johnson" read "*J. H. Johnson*."

TOPICAL AND INDUSTRIAL SECTION.

[At the request of many of our readers we are again extending the space devoted to this Section, and are open to receive for publication particulars of interesting installations, new developments in lamps, fixtures, and all kinds of apparatus connected with illumination.

The contents of these pages, in which is included information supplied by the makers, will, it is hoped, serve as a guide to recent commercial developments, and we welcome the receipt of all *bona-fide* information relating thereto.]

A NEW SERIES OF REFLECTORS FOR INDUSTRIAL LIGHTING.

At the invitation of the British Thomson-Houston Co., Ltd., a visit was recently paid to Mazda House in order to inspect the new range of Mazdalux metal reflectors for industrial lighting. During the last few years there has been a great advance in methods of factory lighting, not the least important step being the introduction of standard types of reflectors designed to screen the source and distribute the light in a predetermined scientific manner.

The new series of Mazdalux reflectors appears to represent a distinct advance on the previous reflectors of this kind. There are now available reflectors specially designed for "half-watt" as well as ordinary metal filament lamps, ranging in candlepower from 10—3000. For each size of lamp reflectors giving no less than *ten* distinct characteristic distributions of light, as illustrated in the accompanying table, can be obtained.

The reflectors are available in three classes of finish, namely aluminium with special matt aluminium interior reflecting surface and French grey enamel outside; steel with similar finish; and steel with white vitreous enamel both inside and outside. There are also eight styles of caps or housings available for all types of lamps up to date.

What, however, struck us as the most interesting feature is the elaborate way in which the characteristic qualities of each reflector are tabulated and catalogued. Attached to each reflector is a label giving full data, distribution curve, size of Mazda lamp to use and instructions for correct installation.

The Mazdalux price list gives some interesting data including an article on "How to plan lighting installations." As this information will fit in more suitably with the contents of our next issue we mean to deal with it more fully on that occasion, and to illustrate some typical reflectors while doing so.

Form of Distribution.	Angle of maximum ray.	Spacing for even illumination.	Angle of cut off.	Maximum cp.
Dispersive V.E. ..	30 deg.	2 times	90 deg.	1·75 times
Extra Extensive ..	60 „	2·5 „	85 „	1·4 „
Extensive	25 „	2 „	80 „	1·5 „
Intensive	25—40	1·5 „	75 „	1·7 „
Focussing	0 deg.	1 „	65 „	2·75 „
Concentrating ..	0 „	½ „	55 „	4·5 „
15 deg. angle ..	15 „	1 „	75 & 105 deg.	2·5 „
30 deg. „ ..	30 „	1 „	65 & 115 „	2·5 „
45 deg. „ ..	45 „	1 „	55 & 135 „	2·5 „
90 deg. „ ..	90 „	1 „	20 & 160 „	2·5 „

"EDISWAN" HALF-WATT LAMP FITTINGS.

A leaflet from the Edison and Swan United Electric Light Co., Ltd., describes some of the Company's new half-watt fittings.

The lantern shown is for interior and exterior use, and is stated to be waterproof and efficiently ventilated.

A feature is the special form of adjustment to counteract any variation in the length of the lamps for which it is intended.

G.E.C. ELECTRIC LIGHTING FITTINGS.

We are interested to note that the **General Electric Co., Ltd.,** making an improvement in the factor of safety of their electric lighting fittings by discontinuing the use of Nos. 38 and 40 gauges and instead using such a number of strands of No. 36 gauge for flexible cords, as to give the equivalent section in solid copper.

In this way the tensile strain on flexible cords will be considerably diminished. Although a detail in design, it is by no means an unimportant one.

Messrs. **Siemens Bros. Dynamo Works Ltd.** have received an acceptance of their tender for the supply of Wotan, Tantalum and carbon filament lamps from Messrs. G. Thompson & Co., The Aberdeen White Star Line, 7, Billiter Square, E.C.

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